Hoshizaki America, Inc.

Modular Cubelet
Serenity Series

Model
FS-1500MLH-C

Including
Condensing Unit Model
SRC-14H

SERVICE MANUAL

"A Superior Degree of Reliability"

www.hoshizaki.com

Number: 73190
Issued: 9-20-2011
Revised: 10-28-2011

⚠ WARNING

Only qualified service technicians should install and service the icemaker. To obtain the name and phone number of your local Hoshizaki Certified Service Representative, visit www.hoshizaki.com. No service should be undertaken until the technician has thoroughly read this Service Manual. Failure to service and maintain the equipment in accordance with this manual will adversely affect safety, performance, component life, and warranty coverage and may result in costly water damage. Proper installation is the responsibility of the installer. Product failure or property damage due to improper installation is not covered under warranty.

Hoshizaki provides this manual primarily to assist qualified service technicians in the service and maintenance of the icemaker.

Should the reader have any questions or concerns which have not been satisfactorily addressed, please call, send an e-mail message, or write to the Hoshizaki Technical Support Department for assistance.

Phone: 1-800-233-1940; (770) 487-2331
Fax: 1-800-843-1056; (770) 487-3360

E-mail: techsupport@hoshizaki.com

HOSHIZAKI AMERICA, INC.
618 Highway 74 South
Peachtree City, GA 30269
Attn: Hoshizaki Technical Support Department

Web Site: www.hoshizaki.com

NOTE: To expedite assistance, all correspondence/communication MUST include the following information:

- Model Number _____
- Serial Number _____
- Complete and detailed explanation of the problem.

IMPORTANT
This manual should be read carefully before the icemaker is serviced. Read the warnings and guidelines contained in this booklet carefully as they provide essential information for the continued safe use, service, and maintenance of the icemaker. Retain this booklet for any further reference that may be necessary.

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Important Safety Information

Throughout this manual, notices appear to bring your attention to situations which could result in death, serious injury, damage to the appliance, or damage to property.

⚠ WARNING **Indicates a hazardous situation which could result in death or serious injury.**

NOTICE **Indicates a situation which could result in damage to the appliance or property.**

IMPORTANT **Indicates important information about the use and care of the appliance.**

⚠ WARNING

This icemaker should be destined only to the use for which it has been expressly conceived. Any other use should be considered improper and therefore dangerous. The manufacturer cannot be held responsible for injury or damage resulting from improper, incorrect, and unreasonable use. Failure to service and maintain the equipment in accordance with this manual will adversely affect safety, performance, component life, and warranty coverage and may result in costly water damage.

To reduce the risk of death, electric shock, serious injury, or fire, follow basic precautions including the following:

- Only qualified service technicians should install and service these units.
- These units must be installed in accordance with applicable national, state, and local codes and regulations.
- Before Servicing: Move the power switch to the "OFF" position. Unplug the icemaker from the electrical outlet and turn off the power supply to the condensing unit. Place the disconnect (if applicable) in the off position. Lockout/Tagout to prevent the power supply from being turned back on inadvertently.
- To reduce the risk of electric shock, make sure the icemaker power switch is in the "OFF" position before plugging in or unplugging the icemaker.
- Do not make any alterations to the icemaker or condensing unit. Alterations could result in electric shock, injury, fire, or damage to the units.

FS-1500MLH-C

- This icemaker requires an independent power supply of proper capacity. See the nameplate for electrical specifications. Failure to use an independent power supply of proper capacity can result in a tripped breaker, blown fuse, damage to existing wiring, or component failure. This could lead to heat generation or fire.
- **THIS UNIT MUST BE GROUNDED.** This unit is equipped with a NEMA 5-15 three-prong grounding plug to reduce the risk of potential shock hazards. It must be plugged into a properly grounded, independent 3-prong wall outlet. If the outlet is a 2-prong outlet, it is your personal responsibility to have a qualified electrician replace it with a properly grounded, independent 3-prong wall outlet. Do not remove the ground prong from the power cord and do not use an adapter plug.
- Do not use an extension cord.

⚠ WARNING, continued

FS-1500MLH-C continued

- To reduce the risk of electric shock, do not touch the power switch or plug with damp hands.
- Do not use an icemaker with a damaged power cord. The power cord should not be altered, jerked, bundled, weighed down, pinched, or tangled. Such actions could result in electric shock or fire. To unplug the icemaker, be sure to pull the plug, not the cord, and do not jerk the cord.
- Do not make any alterations to the icemaker. Alterations could result in electric shock, injury, fire, or damage to the icemaker.
- Do not place fingers or any other objects into the ice discharge opening.

SRC-14H

- Electrical connection must be hard-wired and must meet national, state, and local electrical code requirements. Failure to meet these code requirements could result in death, electric shock, serious injury, fire, or severe damage to equipment.
- This remote condensing unit requires an independent power supply of proper capacity. See the nameplate for electrical specifications. Failure to use an independent power supply of proper capacity can result in a tripped breaker, blown fuse, damage to existing wiring, or component failure. This could lead to heat generation or fire.
- **THIS UNIT MUST BE GROUNDED.** Failure to properly ground the remote condensing unit could result in death or serious injury.
- Lockout/Tagout to prevent the power supply from being turned back on inadvertently.

NOTICE

- Follow the instructions in this manual carefully to reduce the risk of costly water damage.
- In areas where water damage is a concern, install in a contained area with a floor drain.
- Install the icemaker in a location that stays above freezing. Normal operating ambient temperature must be within 45°F to 100°F (7°C to 38°C).
- Do not leave the icemaker on during extended periods of non-use, extended absences, or in sub-freezing temperatures. To properly prepare the icemaker for these occasions, follow the instructions in "V.I.C. Preparing the Icemaker for Periods of Non-Use."
- Keep ventilation openings, in the appliance enclosure or in the built-in structure, clear of obstruction.
- Do not place objects on top of the icemaker.
- The dispenser unit/storage bin is for ice use only. Do not store anything else in the dispenser unit/storage bin.

I. Specifications

A. Icemaker

1. FS-1500MLH-C with SRC-14H

AC SUPPLY VOLTAGE	120/60/1			
AMPERAGE	120 V 3.6RLA			
MINIMUM CIRCUIT AMPACITY	15 A			
MAXIMUM FUSE SIZE	15 A			
APPROXIMATE ICE PRODUCTION PER 24 HR. lb./day (kg/day) Reference without *marks	Ambient Temp.(°F)	WATER TEMP. (°F) 50	70	90
	70	*1491 (676)	1444 (655)	1383 (627)
	80	1324 (601)	1268 (575)	1215 (551)
	90	1163 (528)	*1165 (528)	1067 (484)
	100	1022 (464)	979 (444)	*906 (411)
SHAPE OF ICE	Cubelet			
ICE HARDNESS FACTOR	Approximate 80%, (90/70F°, conductivity 200 µS/cm)			
APPROXIMATE STORAGE CAPACITY	N/A			
ELECTRIC & WATER CONSUMPTION	90/70°F	70/50°F		
ELECTRIC W (kWH/100 lb.)	2122 (4.51)	2097 (3.75) FS-1500MLH-C & SRC-14H		
ELECTRIC W (kWH/100 lb.)	467 (0.82)	509 (0.96) FS-1500MLH-C ONLY		
POTABLE WATER gal./24HR (gal./100 lb.)	140 (12.0)	179 (12.0)		
EXTERIOR DIMENSIONS (WxDxH)	30"x16.5"x33" (765x418x836mm)			
EXTERIOR FINISH	Stainless Steel, Galvanized Steel (Rear)			
WEIGHT	Net lb. 182 (83 kg), Shipping lb. 222 (101kg)			
CONNECTIONS - ELECTRIC	Cord Connection			
- WATER SUPPLY	Inlet 1/2" FPT			
- DRAIN	Outlet 3/4" FPT			
- REFRIGERATION CIRCUIT	Suction line 1-1/16"-12 (#10 PARKER)			
	Liquid line 5/8"-18 (#6 PARKER)			
ICE MAKING SYSTEM	Auger Type			
HARVESTING SYSTEM	Direct Driven Auger (1/2HP Gear Motor)			
ICE MAKING WATER CONTROL	Float Switch			
BIN CONTROL SYSTEM (Primary)	Photoelectric Sensor			
BIN CONTROL SYSTEM (Secondary)	Mechanical Bin Control and Timer			
CONDENSING UNIT	Air-Cooled Remote Condensing Unit SRC-14H			
EVAPORATOR	Copper Tube on Cylinder			
REFRIGERANT CONTROL	Thermostatic Expansion Valve			
	Headmaster (C.P.R.) in SRC-14H (190 PSIG)			
REFRIGERANT CHARGE	R-404A, 11 lb. (5000 g)			
	(Ice Maker: 0 lb. 4 oz. (100 g))			
	(Remote Condensing Unit: 10 lb. 12 oz. (4900 g))			
DESIGN PRESSURE	High 427 PSIG, Low 190 PSIG			
P.C. BOARD CIRCUIT PROTECTION	1A Fuse and High Voltage Cut-Out (internal)			
GEAR MOTOR PROTECTION	7A Fuse			
REFRIGERANT CIRCUIT PROTECTION	Auto-Reset High Pressure Switch, Manual-Reset Low Pressure Switch in SRC-14H			
LOW WATER PROTECTION	Float Switch and Timer			
ACCESSORIES - SUPPLIED	Gear Motor Spare Fuse (2)			
- REQUIRED	Dispenser Unit or Ice Storage Bin			
	Remote Condensing Unit: SRC-14H			
OPERATING CONDITIONS	VOLTAGE RANGE			104-127VAC
	AMBIENT TEMP.			
	FS-1500MLH-C			45-100°F
	SRC-14H			-4-122°F
	WATER SUPPLY TEMP.			45-90° F
	WATER SUPPLY PRESSURE			10-113 PSIG

Note: We reserve the right to make changes in specifications and design without prior notice.

B. Condensing Unit

1. SRC-14H

AC SUPPLY VOLTAGE	208-230/60/1 (3 WIRE w/NEUTRAL FOR 115VAC)			
COMPRESSOR	208-230	6.9 RLA	45.7 LRA	
FAN MOTOR (EACH)	120 V	3 A	MAX	
OTHER	120 V	0.2 A		
MAXIMUM FUSE SIZE	20 A			
MAX. HACR BREAKER (USA ONLY)	20 A			
MAX. CIRC. BREAKER (CANADA ONLY)	20 A			
MINIMUM CIRCUIT AMPACITY	20 A			
EXTERIOR DIMENSIONS (WxDxH)	35-5/8"x21-7/8"x22" (897x555x558mm)			
DIMENSIONS WITH LEGS (WxDxH)	37-7/8"x25-1/2"x37" (960x645x938mm)			
EXTERIOR FINISH	Galvanized Steel			
WEIGHT	Net 190 lb. (86 kg), Shipping 235 lb. (107 kg)			
CONNECTIONS - ELECTRIC	Permanent Connection			
- REFRIGERATION	Discharge line	1-1/16-12 (#10 PARKER)		
CIRCUIT	Liquid line	5/8-18 (#6 PARKER)		
COMPRESSOR	Hermetic, Model CS12K6E-PFV-279			
CONDENSER	Air-Cooled Fin and Tube Type			
COMPRESSOR PROTECTION	Auto-Reset Internal Protecter			
FAN MOTOR PROTECTION	Thermal Protector			
REFRIGERATANT CIRCUIT PROTECTION	Auto-Reset High Pressure Switch, Manual-Reset Low Pressure Switch			
REFRIGERANT CONTROL	Headmaster (C.P.R.) (190 PSIG)			
PUMPDOWN CONTROL	Auto-Reset Low Pressure Switch			
REFRIGERANT CHARGE	R404A 11 lb. (5000 g)			
	(Remote Condensing Unit:10 lb. 12 oz. (4900 g))			
	(Icemaker 0 lb. 4 oz. (100 g))			
DESIGN PRESSURE	High 427 PSIG, Low 230 PSIG			
OPERATING CONDITIONS	VOLTAGE RANGE			187-253VAC
	AMBIENT TEMP.			-4-122°F
	HEAT OF REJECTION			17,700 BTU/hr
ACCESSORIES -SUPPLIED	Leg			2 pcs.
	Hex Head Bolt w/Washer 8X16		M8x16	8 pcs.
	Hex Nut		M8	8 pcs.
-REQUIRED	Compatible Icemaker			

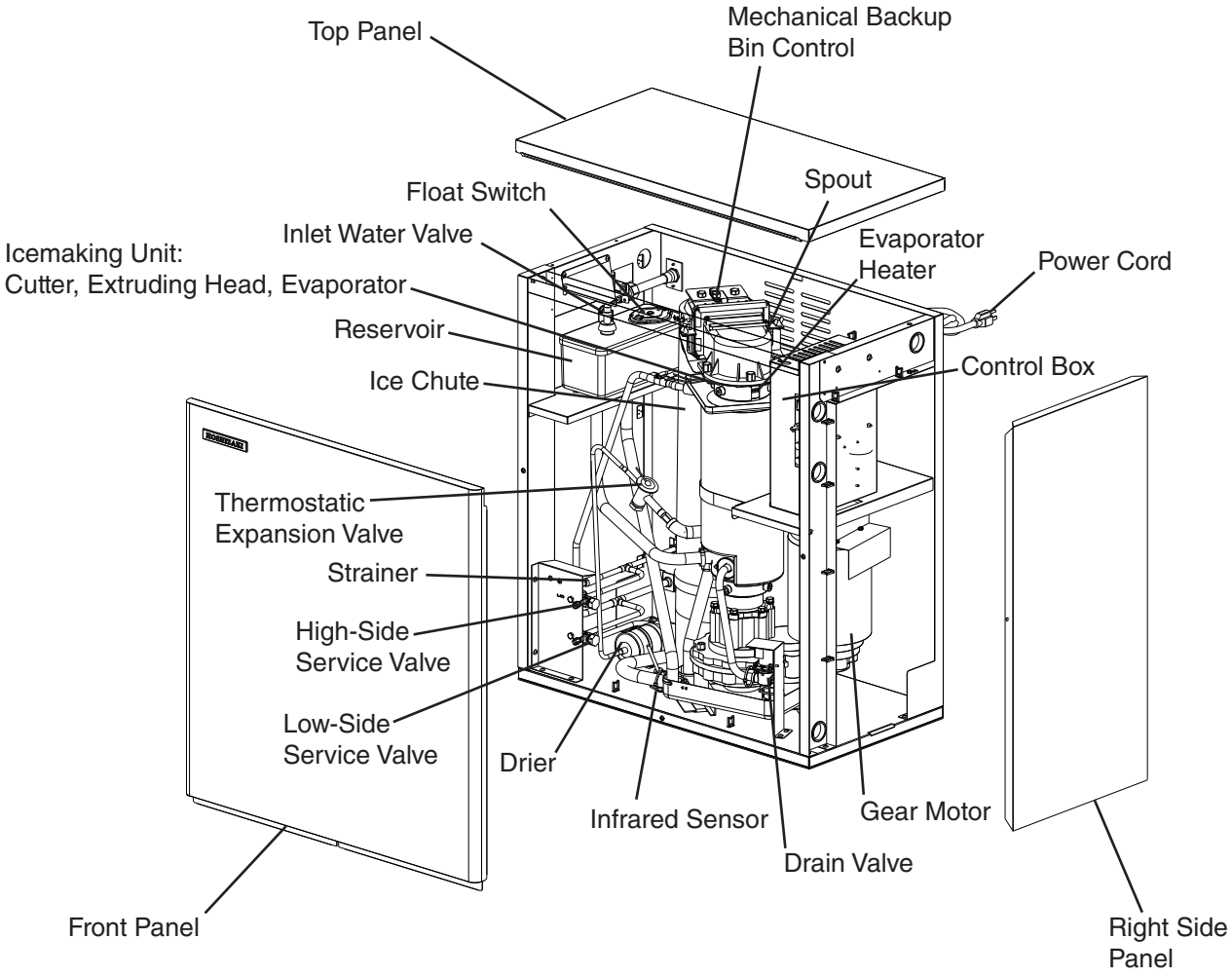
Note: We reserve the right to make changes in specifications and design without prior notice.

II. General Information

A. Construction

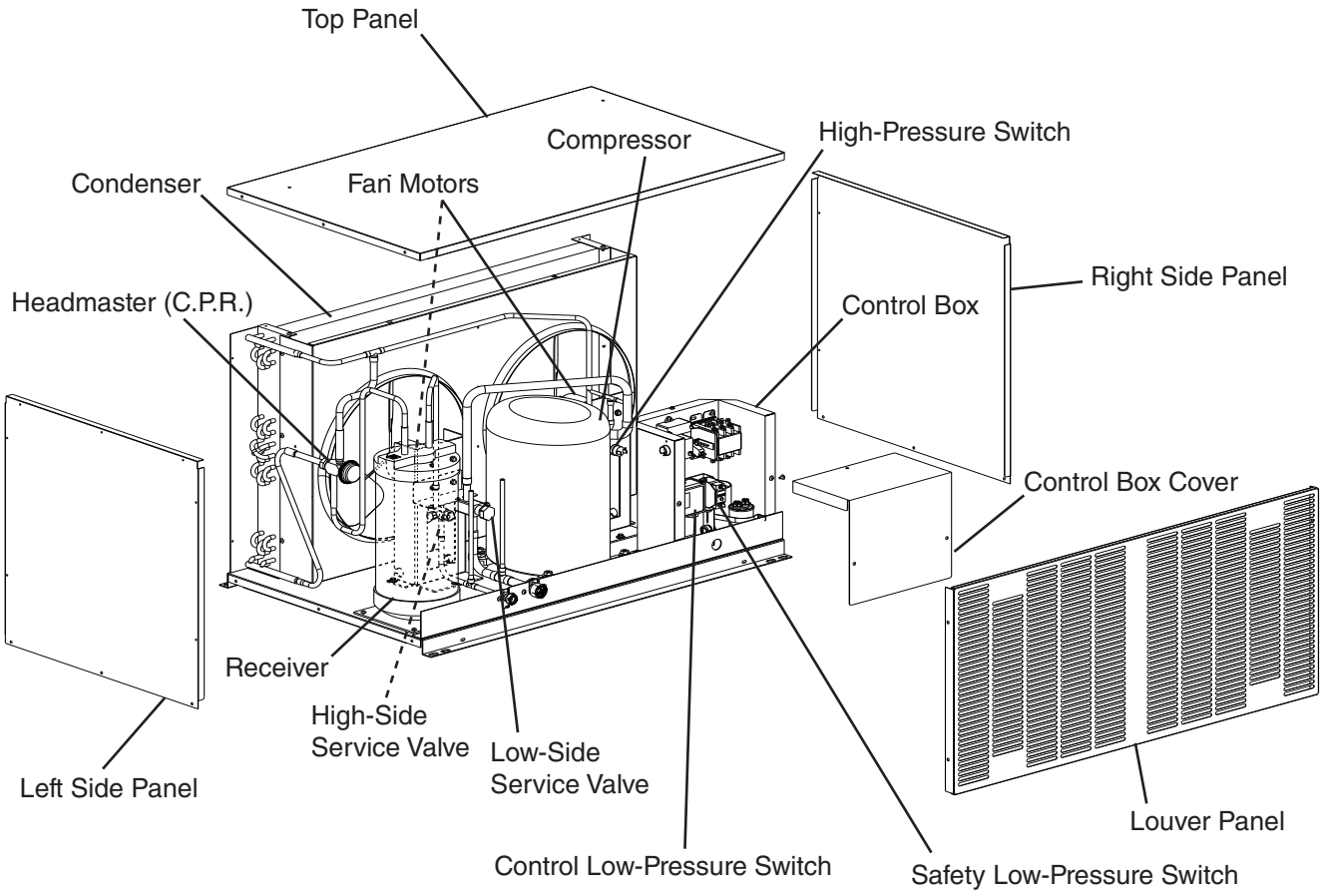
1. Icemaker

a) FS-1500MLH-C

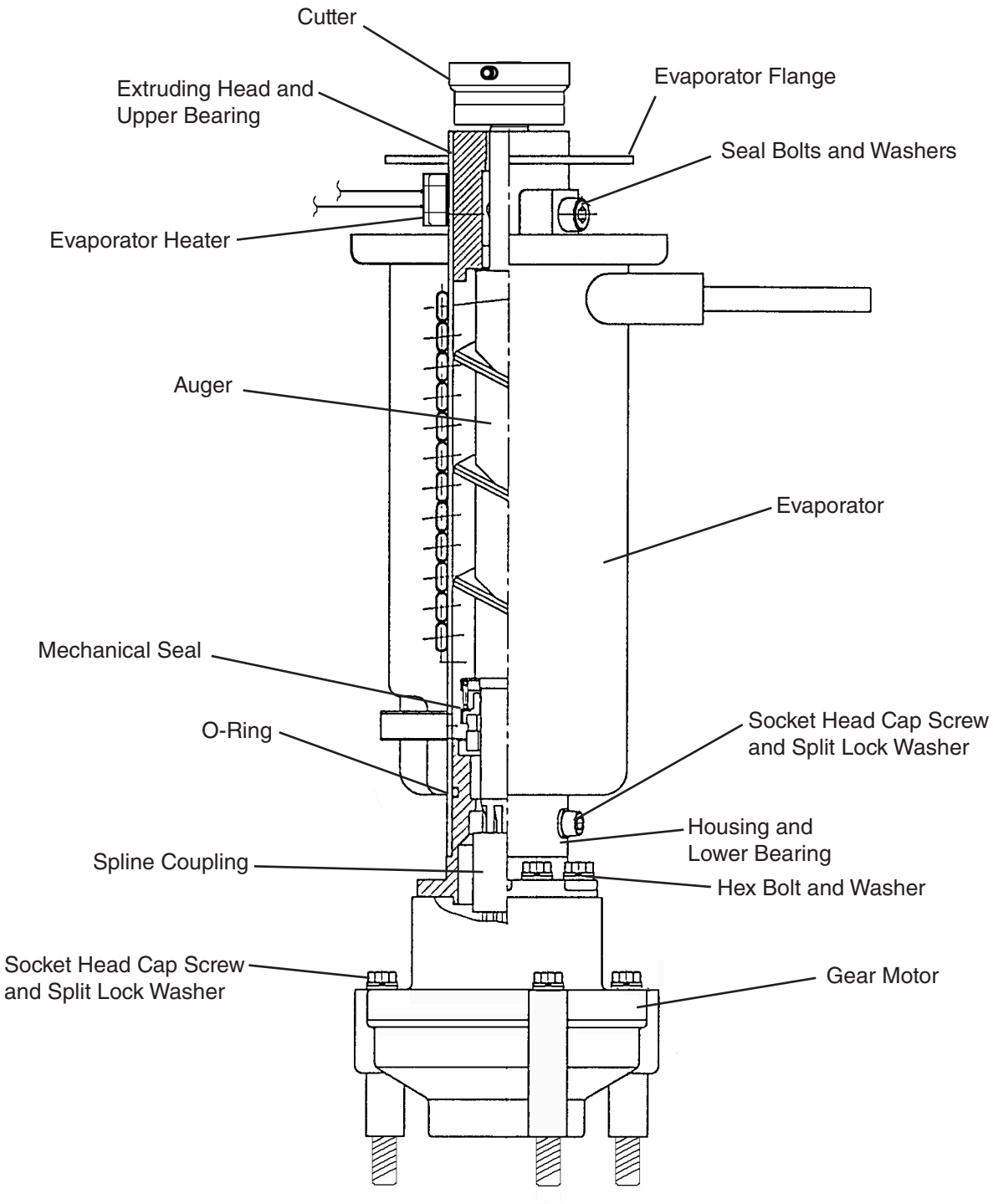


2. Condensing Unit

a) SRC-14H



3. Icemaking Unit



B. Sequence of Operation

1. Sequence Cycles and Shutdown

The steps in the sequence are as outlined below. When power is supplied, the power switch is in the "ON" position, and the control switch is in the "ICE" position, CB green "POWER OK" LED and IS green LED turn on. CB green "POWER OK" LED remains on constantly. If IS green LED is off and IS yellow LED is on or flashing, move ice away from IS lens.

a) Fill Cycle

"WTRIN" LED is on. Reservoir is empty and LF/S and UF/S are open. FT starts. WV energizes and fill cycle starts. LF/S closes. Nothing happens at this time. Reservoir continues to fill until UF/S closes. When UF/S closes, FT terminates and WV de-energizes. FZT and 30-second GM delay timer start. If UF/S remains open longer than 90 seconds after LF/S opens, FT exceeded and CB sounds a 1-beep alarm. WV remains energized until UF/S closes. Alarm resets automatically when UF/S closes.

b) Ice Purge Cycle

"GM" LED is on. 30-second GM delay timer terminates. GM, GMPR, and EH energize. 5-minute ice purge timer starts: GM runs for 5 minutes to clear any ice from the evaporator. To bypass the 5-minute ice purge timer, press CB "SERVICE" button after GM starts. **WARNING! Risk of electric shock. Care should be taken not to touch live terminals.**

Note: UF/S must be closed before GM will energize.

c) Freeze Cycle

"COMP" and "GM" LEDs are on. 5-minute ice purge timer terminates. GM, GMPR, and EH continue. PDS energizes. When CLPS (in SRC) closes, MC energizes, allowing Comp and FMRs to energize. CCH de-energizes. Ice production starts 4 to 6 minutes after Comp energizes depending on ambient and water conditions. UF/S and LF/S operate WV as needed to continue the icemaking process. As ice is produced, the water level in the reservoir drops. UF/S opens. Nothing happens at this time. When LF/S opens, FZT terminates and FT starts. If LF/S remains closed longer than 30 minutes after UF/S closes, CB shuts down the icemaker and sounds a 5-beep alarm. To reset alarm, move the power switch to the "OFF" position, and then back to the "ON" position. ***Refill:*** **"WTRIN," "COMP," and "GM" LEDs are on.** LF/S and UF/S are open. WV energizes. GM, GMPR, EH, PDS, MC, Comp, and FMRs continue. LF/S closes. Nothing happens at this time. Reservoir continues to fill until UF/S closes. When UF/S closes, FT terminates and FZT starts. WV de-energizes. If UF/S remains open longer than 90 seconds after LF/S opens, FT exceeded and CB sounds a 1-beep alarm. WV remains energized until UF/S closes. Alarm resets automatically when UF/S closes.

d) Drain Cycle

(1) 1-in-1 Drain Cycle: DV energizes for 2 seconds once every hour when the 1-in-1 drain cycle is activated (S1 dip switch 4 off (factory default position)). 1-hour DCT terminates, 2-second DVT starts. DV energizes for 2 seconds. 2-second DVT terminates, 1-hour DCT starts. All components and icemaking continue. This setting is recommended for optimum icemaker performance. The 1-in-1 drain cycle allows any sediment to drain from the evaporator without interrupting the icemaking process.

(2) 1-in-12 Drain Cycle (optional): DV energizes for ten minutes once every 12 hours when the 1-in-12 drain cycle is activated (S1 dip switch 4 on (optional)). 12-hour DCT terminates, 5-minute ice purge timer begins, PDS de-energizes, GM, GMPR, and EH continue. Unit is in pump-down mode. When the refrigerant low-side pressure drops to 9 PSIG, CLPS opens, MC de-energizes, de-energizing Comp and FMRs. When the 5-minute ice purge timer terminates, GM, GMPR, and EH de-energize. 10-minute DVT starts, DV energizes for 10 minutes. After 10-minute DVT terminates, 12-hour DCT starts.

(3) Manual Drain: Manual drain is used when servicing the evaporator components and cleaning and sanitizing the unit. When the unit is making ice and the control switch is moved to the "DRAIN" position, there is a 3-second delay, then the 5-minute ice purge timer begins and PDS de-energizes. Unit is in pump-down mode. When the refrigerant low-side pressure drops to 9 PSIG, CLPS opens, MC de-energizes, de-energizing Comp and FMRs. When the 5-minute ice purge timer terminates, GM, GMPR, and EH de-energize. DV energizes. To avoid the 5-minute shutdown delay, move the power switch to the "OFF" position, then move the control switch to the "DRAIN" position. Move the power switch to the "ON" position. DV energizes and remains energized until the control switch is moved to the "ICE" position or the power switch is moved to the "OFF" position. If the control switch is left in the "DRAIN" position for over 15 minutes, CB sounds a 2-beep alarm. To reset, move the control switch to the "ICE" position.

e) Shutdown Cycle

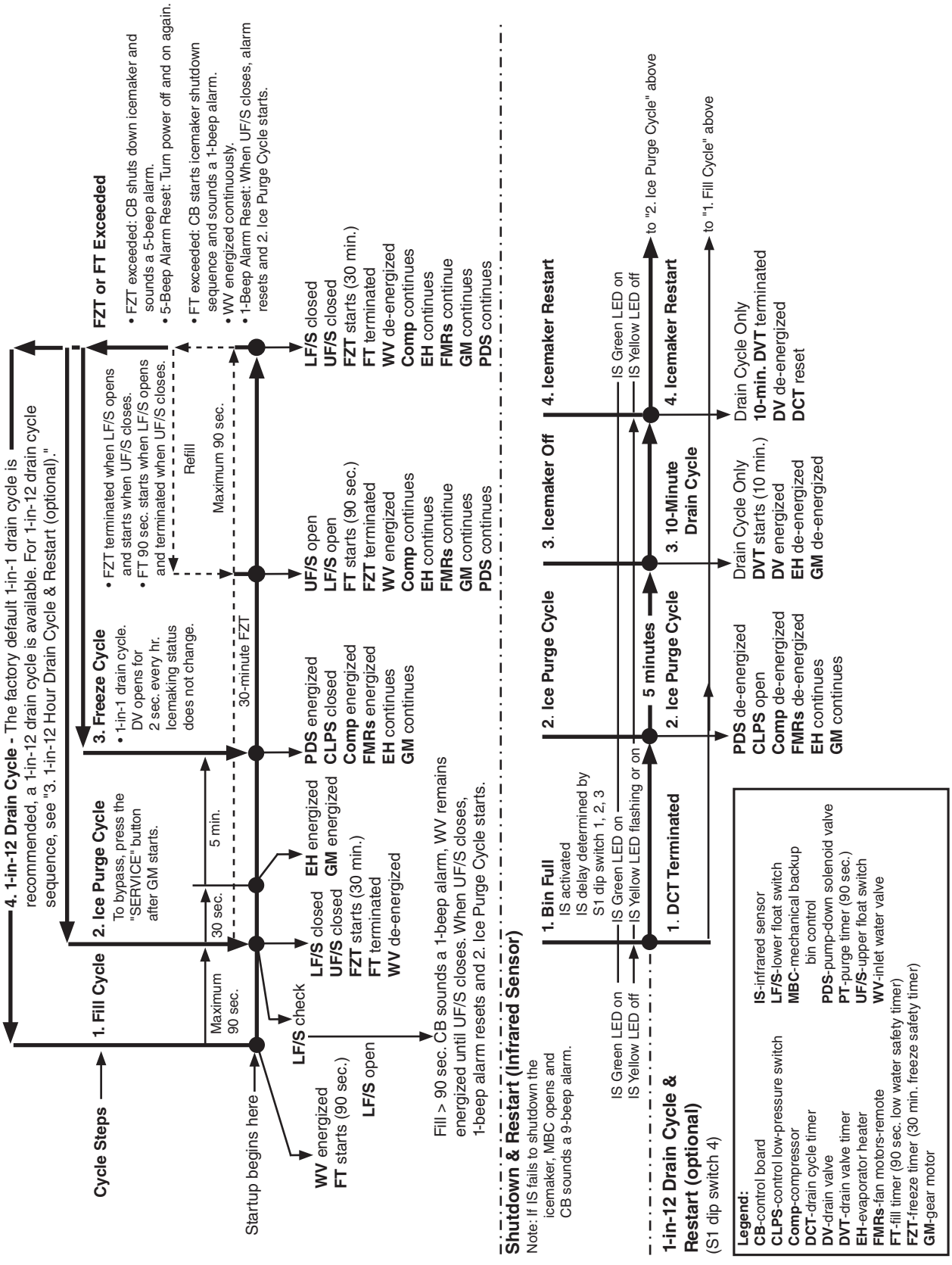
(1) Infrared Sensor: When ice activates IS, yellow LED starts flashing when ice is at the outer limit of its range and turns steady as ice nears. After IS yellow LED turns on (flashing or steady), IS shutdown delay timer (S1 dip switch 1, 2, 3) starts. For a typical dispenser unit application, a 100-second shutdown delay is recommended. When used with a standard Hoshizaki storage bin, any shutdown delay setting is acceptable. See "II.C.3.b) Infrared Sensor Shutdown Delay (S1 dip switch 1, 2, 3)." Once IS shutdown delay timer terminates, PDS de-energizes and the 5-minute ice purge timer starts. Unit is in pump-down mode. When the refrigerant low-side pressure drops to 9 PSIG, CLPS opens, MC de-energizes, de-energizing Comp and FMRs. When the 5-minute ice purge timer terminates, GM, GMPR, and EH de-energize.

Note: If IS fails to shut down the icemaker, MBC opens, CB shuts down the icemaker and sounds a 9-beep alarm.

(2) Mechanical Backup Bin Control: MBC opens (actuator paddle engaged). CB shuts down the icemaker within 10 seconds and sounds a 9-beep alarm.

Legend: **CB**–control board; **CCH**–crankcase heater; **CLPS**–control low-pressure switch; **Comp**–compressor; **DCT**–drain cycle timer; **DV**–drain valve; **DVT**–drain valve timer; **EH**–evaporator heater; **FMRs**–fan motors-remote; **FT**–fill timer (90-second low water safety timer); **FZT**–freeze timer (30-minute freeze safety timer); **GM**–gear motor; **GMPR**–gear motor protect relay; **IS**–infrared sensor bin control; **LF/S**–lower float switch; **MBC**–mechanical backup bin control; **MC**–magnetic contactor; **PDS**–pump-down solenoid valve; **UF/S**–upper float switch; **WV**–inlet water valve

2. Sequence Flow Chart


"F-A" Control Board Sequence Flow Chart
FS-1500MLH-C with SRC-14H
Cycle Steps
Startup begins here
4. 1-in-12 Drain Cycle - The factory default 1-in-1 drain cycle is recommended, a 1-in-12 drain cycle is available. For 1-in-12 drain cycle sequence, see "3. 1-in-12 Hour Drain Cycle & Restart (optional)."
1. Fill Cycle
Maximum 90 sec.
LF/S check
WV energized
FT starts (90 sec.)
LF/S open
2. Ice Purge Cycle
To bypass, press the "SERVICE" button after GM starts.
30 sec.
5 min.
LF/S closed
UF/S closed
FZT starts (30 min.)
FT terminated
WV de-energized
EH energized
GM energized
3. Freeze Cycle
• 1-in-1 drain cycle. DV opens for 2 sec. every hr. Icemaking status does not change.
30-minute FZT
PDS energized
CLPS closed
Comp energized
FMRs energized
EH continues
GM continues
• FZT terminated when LF/S opens and starts when UF/S closes.
• FT 90 sec. starts when LF/S opens and terminated when UF/S closes.
Refill
Maximum 90 sec.
UF/S open
LF/S open
FT starts (90 sec.)
FZT terminated
WV energized
Comp continues
EH continues
FMRs continue
GM continues
PDS continues
FZT or FT Exceeded
• FZT exceeded: CB shuts down icemaker and sounds a 5-beep alarm.
• 5-Beep Alarm Reset: Turn power off and on again.
• FT exceeded: CB starts icemaker shutdown sequence and sounds a 1-beep alarm.
• WV energized continuously.
• 1-Beep Alarm Reset: When UF/S closes, alarm resets and 2. Ice Purge Cycle starts.
LF/S closed
UF/S closed
FZT starts (30 min.)
FT terminated
WV de-energized
Comp continues
EH continues
FMRs continue
GM continues
PDS continues
Fill > 90 sec. CB sounds a 1-beep alarm, WV remains energized until UF/S closes. When UF/S closes, 1-beep alarm resets and 2. Ice Purge Cycle starts.
Shutdown & Restart (Infrared Sensor)
Note: If IS fails to shutdown the icemaker, MBC opens and CB sounds a 9-beep alarm.
1. Bin Full
IS activated
IS delay determined by S1 dip switch 1, 2, 3
IS Green LED on
IS Yellow LED off
2. Ice Purge Cycle
3. Icemaker Off
4. Icemaker Restart
IS Green LED on
IS Yellow LED flashing or on
5 minutes
IS Green LED on
IS Yellow LED off
to "2. Ice Purge Cycle" above
1-in-12 Drain Cycle & Restart (optional)
(S1 dip switch 4)
1. DCT Terminated
2. Ice Purge Cycle
3. 10-Minute Drain Cycle
4. Icemaker Restart
to "1. Fill Cycle" above
PDS de-energized
CLPS open
Comp de-energized
FMRs de-energized
EH continues
GM continues
Drain Cycle Only
DVT starts (10 min.)
DV energized
EH de-energized
GM de-energized
Drain Cycle Only
10-min. DVT terminated
DV de-energized
DCT reset
Legend:
CB-control board
CLPS-control low-pressure switch
Comp-compressor
DCT-drain cycle timer
DV-drain valve
DVT-drain valve timer
EH-evaporator heater
FMRs-fan motors-remote
FT-fill timer (90 sec. low water safety timer)
FZT-freeze timer (30 min. freeze safety timer)
GM-gear motor
IS-infrared sensor
LF/S-lower float switch
MBC-mechanical backup bin control
PDS-pump-down solenoid valve
PT-purge timer (90 sec.)
UF/S-upper float switch
WV-inlet water valve

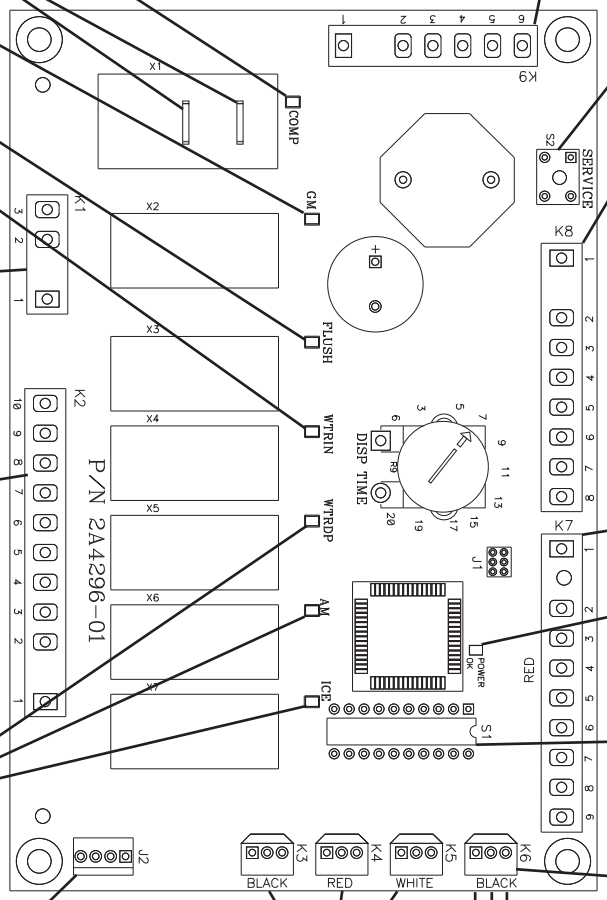
C. Control Board

- A Hoshizaki exclusive control board is employed in Hoshizaki Modular Flakers.
- All models are pre-tested and factory adjusted.
- For a control board check procedure, see "IV.C. Control Board Check."

NOTICE
• The control board is fragile; handle very carefully. • The control board contains integrated circuits, which are susceptible to failure due to static discharge. It is especially important to touch the metal part of the icemaker before handling or replacing the control board. • Do not touch the electronic devices on the control board or the back of the control board. • Do not change wiring and connections. Do not misconnect terminals. • Do not short out power supply to test for voltage. • Always replace the whole control board assembly if it goes bad.

1. Control Board Layout

"F-A" Control Board



- **Relay LEDs (green)** (indicate which relays and connector pins are energized)
- **"COMP" LED (X1 Relay)** X1 Relay Terminals (115VAC)
- **"GM" LED (X2 Relay)** K1 Connector Pins #2, 3 (115VAC)
- **"FLUSH" (drain) LED (X3 Relay)** K2 Connector Pin #10
- **"WTRIN" LED (X4 Relay)** K2 Connector Pin #8
- **K1 Connector**
  #1 Open
  #2-GM LED: Gear Motor and Evaporator Heater
  #3 Power Supply Input (115VAC)
- **K2 Connector**
  #1 through #6 Open
  #7 Control Transformer (24VAC input)
  #8 WTRIN LED: Inlet Water Valve
  #9 Control Transformer (24VAC input)
  #10 FLUSH (drain) LED: Drain Valve

  Water Dispensing Valve, Agitation Motor, and Ice Dispensing LEDs (not used on this model)
- **J2 Connector** Open
- **K3, K4, K5 Connectors**-Open
- **K9 Connector (5VDC)**
  #1, 2 Control Switch
  Open: Icemaking
  Closed: Drain
  #3, 4 Jumper
  #5, 6 Gear Motor Protect Relay Circuit
- **S2 "SERVICE" Button (Ice Purge Cycle Bypass)**
- **K8 Connector**
  #1 Control Transformer (24VAC input)
  #2 Control Transformer (24VAC neutral)
  #3, 4 Mechanical Backup Bin Control (5VDC)
  #5 Float Switch Common (5VDC)
  #6 Upper Float Switch
  #7 Lower Float Switch
  #8 Open
- **K7 Connector** Open
- **"POWER OK" LED (green)** (lights when 24VAC is supplied to K8 connector pins #1 & #2)
- **S1 Dip Switch**
- **K6 Connector** Infrared Sensor Bin Control (20VDC)
  #1 Dark Blue
  #2 White (signal) (common)
  #3 Brown (ground)

"F-A" Control Board	
Part Number	2A4296-01

2. LED Lights and Audible Alarm Safeties

At startup, CB green "POWER OK" LED turns on immediately to indicate proper control voltage and will remain on unless a control voltage problem occurs. For further details, see "II.B. Sequence of Operation."

Sequence Step	LED	Energized Components	Min.	Max.
Fill Cycle	WTRIN	WV	-	-
Ice Purge Cycle	GM	GM, EH	5 min.	5 min.
Freeze Cycle (with refill)	GM, COMP, WTRIN* (refill),	GM, EH, PDS, Comp, FMRs, WV* (refill)	-	*On until UF/S closes. Alarm sounds after 90 sec.
1-in-1 Drain Cycle (S1 dip switch 4 off)	FLUSH (Drain) GM, COMP (only if IS not satisfied)	DV Comp, GM, EH, PDS, FMRs (only if IS not satisfied)	2 sec.	2 sec.
1-in-12 Drain Cycle (S1 dip switch 4 on)	FLUSH (Drain)	DV	10 min.	10 min.

The built-in safeties shut down the unit and have alarms as listed below.

No. of Beeps (every 5 sec.)	Type of Alarm	Reset Options
1	Low Water Safety (FT) UF/S open > 90 seconds after WV energized.	Automatic reset once water supply is restored and UF/S closes.
2	Control Switch In "DRAIN" position longer than 15 minutes.	Automatic reset once the control switch is moved to the "ICE" position.
3	High-Pressure Switch: N/A on this model.	See "III.B.2. SRC-14H" for high-pressure switch operation.
4	High-Pressure Switch: N/A on this model.	
5	Freeze Timer (FZT) WV off > 30 minutes since last WV activation.	Manual reset. Turn power off and on again.
6	Low Voltage (92VAC±5% or less)	CB green "POWER OK" LED turns off if voltage protection operates. The control voltage safeties automatically reset when voltage is corrected.
7	High Voltage (147VAC±5% or more)	
8	Gear Motor GMPR contacts fail to close.	Manual reset. Turn power off and on again.
9	Infrared Sensor (S1 dip switch 7) MBC actuator paddle engaged.	Manual reset. Turn power off and on again.

Legend: **CB**–control board; **DV**–drain valve; **EH**–evaporator heater; **FMRs**–fan motors-remote; **FT**–fill timer (90-second low water safety timer); **FZT**–freeze timer (30-minute freeze safety timer); **GM**–gear motor; **IS**–infrared sensor bin control; **MBC**–mechanical backup bin control; **PDS**-pump-down solenoid valve; **WV**–inlet water valve

3. Controls and Adjustments

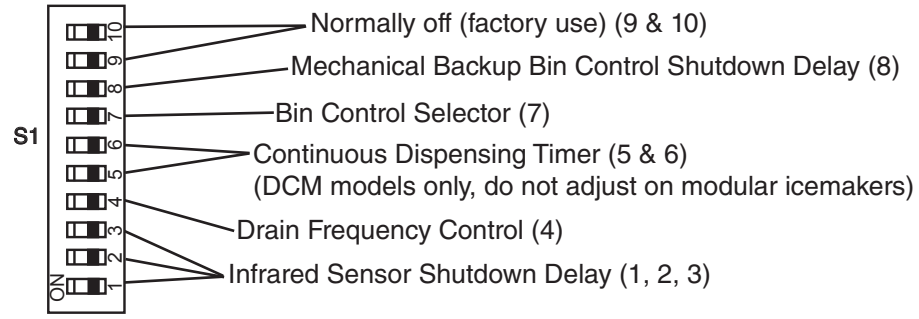
NOTICE
Dip switches are factory set. Failure to maintain factory settings may adversely affect performance and warranty coverage. For more information, contact Hoshizaki Technical Support at 1-800-233-1940.

a) Default Dip Switch Settings

The S1 dip switch settings are factory-set to the following positions:

S1 Dip Switch										
Model	**S1 Dip Switch No.**									
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
FS-1500MLH-C	ON	OFF	OFF	OFF	OFF	OFF	ON	ON	OFF	OFF

S1 Dip Switch



b) Infrared Sensor Shutdown Delay (S1 dip switch 1, 2, 3)

Infrared sensor shutdown delay is the delay between the infrared sensor detecting ice (infrared sensor) yellow LED flashing or steady) and the start of the shutdown sequence. For dispenser unit applications, the ice level at shutoff may need to be adjusted depending on the dispenser agitation or dispense method. Increasing the shutdown delay setting allows for a higher level of ice in the bin before the icemaker shuts down. For a typical dispenser unit application, a 100-second shutdown delay is recommended. When used with a standard Hoshizaki storage bin, any shutdown delay setting is acceptable.

⚠ WARNING
Increasing the shutdown delay allows a higher level of ice in the dispensing unit/ storage bin before shutdown. This could lead to icemaker movement or ice overflow.

S1 Dip Switch Setting			**Infrared Sensor Shutdown Delay**
No. 1	**No. 2**	**No. 3**	
OFF	OFF	OFF	0 Seconds
ON	**OFF**	**OFF**	**100 Seconds (1.6 minutes) (Factory Default)**
OFF	ON	OFF	1100 Seconds (18.3 minutes)
OFF	OFF	ON	1650 Seconds (27.5 minutes)
ON	ON	OFF	2200 Seconds (36.7 minutes)
OFF	ON	ON	0 Seconds
ON	ON	ON	0 Seconds

c) Drain Frequency Control (S1 dip switch 4)

This unit is factory set for optimum performance with the 1-in-1 drain cycle. This setting allows for removal of sediment from the evaporator every hour without interrupting the icemaking process. An optional 1-in-12 drain cycle is available.

S1 Dip Switch Setting No. 4	Drain Timer Interval	Drain Valve Open
OFF (1-in-1)	1 Hour	2 Seconds
ON (1-in-12)	11 Hours 45 Minutes	10 Minutes

d) Continuous Dispensing Timer (S1 dip switch 5 & 6)

DCM models only. The dispense mode switch on DCMs must be in the "CONTINUOUS" position for this setting to apply. The factory setting allows ice to be dispensed continuously as long as the dispense solenoid is activated.

S1 Dip Switch Setting		Dispense Time
No. 5	No. 6	
OFF	OFF	No Limit
ON	OFF	20 Seconds
OFF	ON	60 Seconds
ON	ON	No Limit

e) Bin Control Selector (S1 dip switch 7)

This unit is factory set for infrared sensor bin control operation. No adjustment is required. When used on a standard ice storage bin, the mechanical bin control may be used instead of the infrared sensor by moving S1 dip switch 7 to the off position. In the factory default position (S1 dip switch 7 in the on position), the gear motor delay after the upper float switch closes is 30 seconds. When the mechanical bin control is used (S1 dip switch 7 in the off position), the gear motor delay after the upper float switch closes is 5 seconds. **WARNING! Do not place S1 dip switch 7 in the off position on dispenser unit applications.**

S1 Dip Switch Setting No. 7	Bin Control Application	Gear Motor Delay
OFF	Mechanical Bin Control (Standard Ice Storage Bins Only)	5 seconds
ON	Infrared Sensor with Mechanical Bin Control Backup	30 seconds

f) Mechanical Bin Control Shutdown Delay (S1 dip switch 8)

Factory set for normal operation. No adjustment is required. The shutdown delay is the time between the mechanical bin control proximity switch opening and the control board shutting off the icemaker.

S1 Dip Switch Setting No. 8	Mechanical Backup Bin Control Shutdown Delay
OFF	0.25 Seconds
ON	6.7 Seconds

g) Factory Use (S1 Dip Switch 9 & 10)

Factory set for optimum performance. Do not adjust.

D. Power and Control Switches

The power switch and control switch are used to control the operation of this unit. They are located on the control box.

1. Power Switch

The power switch has 2 positions, "OFF" and "ON." When the power switch is in the "OFF" position, no power is supplied to the components. When in the "ON" position, power is supplied to the control transformer and control board. The control board then supplies 5VDC to the control switch for unit operation.

2. Control Switch

The control switch has 2 positions, "ICE" and "DRAIN." When the control switch is in the "ICE" position (open), the icemaking process begins. When the control switch is in the "DRAIN" position (closed), the drain process begins.

a) ICE

When the control switch is in the "ICE" position, the control board reads an open circuit through the control switch contacts and starts the icemaking process.

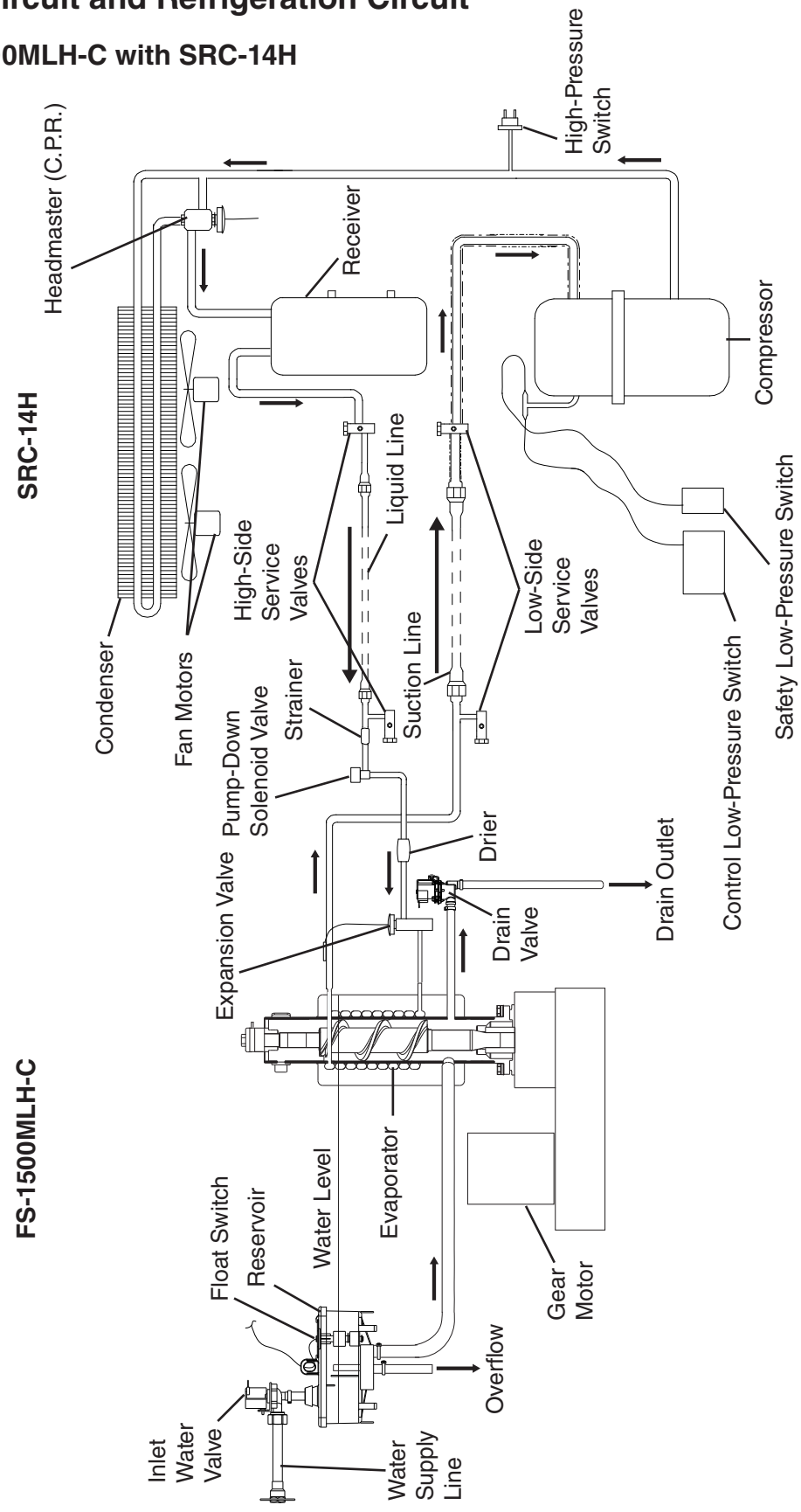
b) DRAIN

When the control switch is in the "DRAIN" position, the control board reads a closed circuit through the control switch and starts the drain process.

III. Technical Information

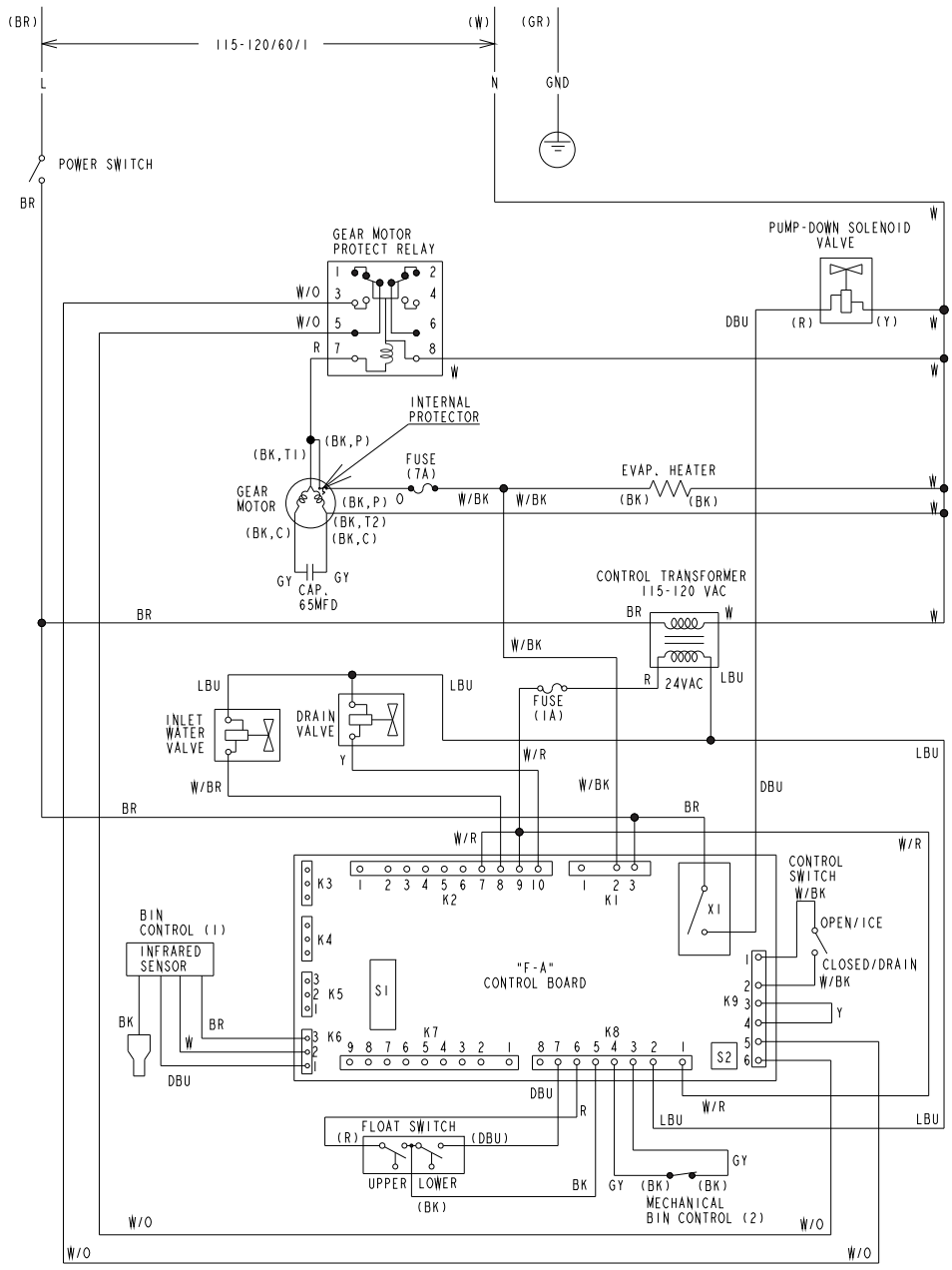
A. Water Circuit and Refrigeration Circuit

1. FS-1500MLH-C with SRC-14H



B. Wiring Diagrams

1. FS-1500MLH-C

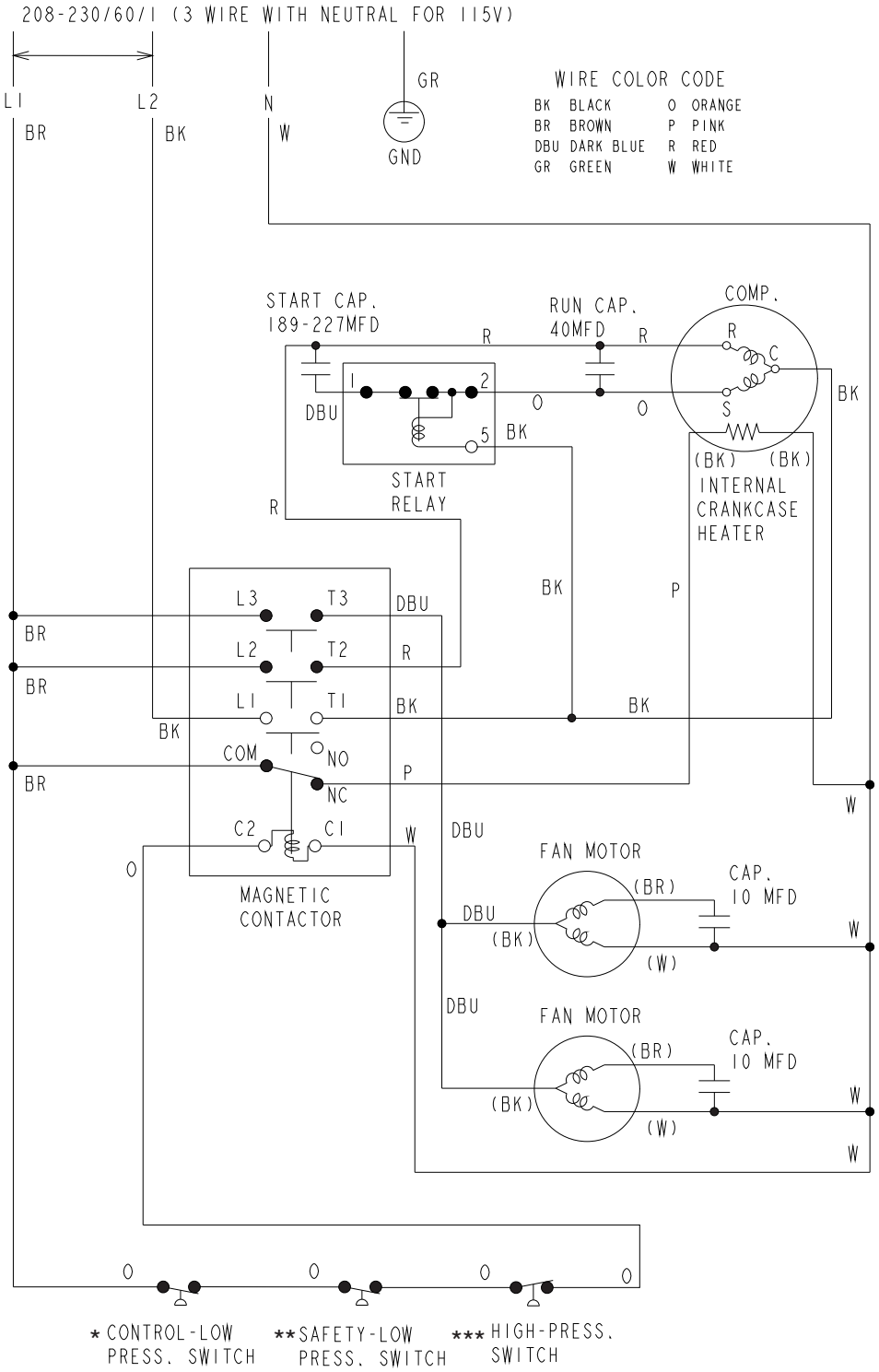


DIP SWITCH S1	1	2	3	4	5	6	7	8	9	10
FS-1500MLH-C	ON	OFF	OFF	OFF	OFF	OFF	ON	ON	OFF	OFF

WIRE CODE COLOR

BK	BLACK	V	VIOLET
BR	BROWN	W	WHITE
DBU	DARK BLUE	Y	YELLOW
GR	GREEN	W/BK	WHITE/BLACK
GY	GRAY	W/BR	WHITE/BROWN
LBU	LIGHT BLUE	W/BU	WHITE/BLUE
O	ORANGE	W/O	WHITE/ORANGE
P	PINK	W/R	WHITE/RED
R	RED		

2. SRC-14H



* Control Low-Pressure Switch	
Cut-in	$29\pm^{0}_{0.5}$ PSIG
Differential	$20\pm^{1.0}_{0.5}$ PSIG
Cut-out	9 PSIG

** Safety Low-Pressure Switch (Manual Reset)	
Cut-out	3±2.5 PSIG
Differential	6 PSIG

*** High-Pressure Switch	
Cut-out	$384\pm^{22}_{0}$ PSIG
Cut-in	284±22 PSIG

C. Performance Data

1. FS-1500MLH-C with SRC-14H

APPROXIMATE ICE PRODUCTION PER 24 HR. lbs/day kg/day	Ambient Temp. (°F)	Water Temp. (°F) 50		70		90	
	70	**1491**	**676**	1444	655	1383	627
	80	1324	601	1268	575	1215	551
	90	1163	528	**1165**	**528**	1067	484
	100	1022	464	979	444	**906**	**411**
APPROXIMATE ELECTRIC CONSUMPTION watts	70	**2097**	--	2101	--	2104	--
	80	2108	--	2111	--	2115	--
	90	2118	--	**2122**	--	2129	--
	100	2136	--	2142	--	**2149**	--
APPROXIMATE WATER CONSUMPTION PER 24 HR. gal/day l/day	70	**179**	**678**	173	656	166	628
	80	159	602	152	576	146	552
	90	140	529	**140**	**529**	128	485
	100	123	465	118	445	**109**	**412**
EVAPORATOR OUTLET TEMP °F °C	70	**10**	**-12**	10	-12	10	-12
	80	10	-12	13	-11	13	-11
	90	13	-11	**13**	**-11**	15	-9
	100	15	-9	15	-9	**15**	-9
HEAD PRESSURE PSIG kg/cm²G	70	**191**	**13.4**	191	13.4	191	13.4
	80	213	15.0	213	15.0	213	15.0
	90	236	16.6	**236**	**16.6**	236	16.6
	100	273	19.2	273	19.2	**273**	**19.2**
SUCTION PRESSURE PSIG kg/cm²G	70	**32**	**2.3**	32	2.3	32	2.3
	80	34	2.4	34	2.4	34	2.4
	90	36	2.5	**36**	**2.5**	36	2.5
	100	39	2.7	39	2.7	**39**	**2.7**
HEAT OF REJECTION	1,400 BTU/h (AT 90°F /WT 70°F) FS-1500MLH-C						
HEAT OF REJECTION	17,700 BTU/h (AT 90°F /WT 70°F) SRC-14H						

Note: We reserve the right to make changes in specifications and design without prior notice.

IV. Service Diagnosis

⚠ WARNING

- This unit should be diagnosed and repaired only by qualified service personnel to reduce the risk of death, electric shock, serious injury, or fire.
- Risk of electric shock. Use extreme caution and exercise safe electrical practices.
- Moving parts (e.g., fan blade) can crush and cut. Keep hands clear.
- **CHOKING HAZARD:** Ensure all components, fasteners, and thumbscrews are securely in place after the unit is serviced. Make sure that none have fallen into the dispenser unit/storage bin.
- Make sure all food zones in the icemaker and dispenser unit/storage bin are clean after the unit is serviced. For cleaning procedures, see "VI.B Cleaning and Maintenance."

A. Ice Production Check

To check production, prepare a bucket or pan to catch the ice and a set of scales to weigh the ice. After the icemaker has operated for 10 to 20 minutes, catch the ice production for 10 minutes. Weigh the ice to establish the batch weight. Multiply the batch weight by 144 for the total production in 24 hours.

B. Diagnostic Procedure

This diagnostic procedure is a sequence check that allows you to diagnose the electrical system and components. Before proceeding, check for correct installation, adequate water pressure (10 to 113 PSIG), and proper voltage per unit nameplate. Check that the 24VAC 1A fuse and the 115VAC 7A GM fuse are good. When checking high-voltage (115VAC), always choose a neutral (W wire) to establish a good neutral connection. When checking low-voltage (secondary) (24VAC), always choose a neutral (LBU wire) to establish a good neutral connection. If the icemaker is in alarm, see "II.C.2. LED Lights and Audible Alarm Safeties."

Note: EH energizes when "GM" LED turns on. CB X1 relay energizes PDS. CLPS closes when the refrigeration circuit low-side pressure reaches 29 PSIG. Once CLPS closes, MC energizes, energizing Comp and FMRs.

1) Remove the front panel, then move the power switch to the "OFF" position. Move the control switch to the "DRAIN" position, then move the power switch back to the "ON" position. Replace the front panel in its correct position.
2) Allow the water system to drain for 5 minutes.
3) Remove the front panel. Move the power switch to the "OFF" position, then unplug the unit from the electrical outlet.
4) Remove the control box cover and access CB.
5) Check the S1 dip switch settings, see "II.C.3.a) Default Dip Switch Settings" to assure that they are in the correct positions. For proper operation of IS, confirm that S1 dip switch 7 is in the "ON" position.

6) **Startup – "POWER OK" LED is on.** Plug the icemaker into the electrical outlet, then move the power switch to the "ON" position. Move the control switch to the "ICE" position. CB green "POWER OK" LED and IS green LED turn on.
Diagnosis CB Green "POWER OK" LED: If CB green "POWER OK" LED is off, check for proper supply voltage (115VAC) input to CT. If 115VAC is not present, check the power switch and breaker. Next, check for proper 24VAC output voltage from CT. Check CB K8 connector pin #1 (W/R wire) to pin #2 (LBU wire) for 24VAC. If 24VAC is not present and 1A 24VAC fuse is good, replace CT. If 24VAC is present and CB green "POWER OK" LED is off, replace CB.
IS Diagnosis: Check that IS green LED is on. If CB green "POWER OK" LED is on and IS green LED is off, check CB K6 connector pin #3 (BR wire) to CB K6 connector pin #1 (DBU wire) for 20VDC. If 20VDC is not present, confirm S1 dip switch 7 is in the "ON" position. If S1 dip switch 7 is in the "ON" position and 20VDC is not present, replace CB. If IS yellow LED is on or flashing, move ice away from IS lens. If no ice is present, clean the lens with a warm, clean damp cloth. If IS yellow LED is still on or flashing after cleaning the lens, replace IS. **MBC Diagnosis**: Move S1 dip switch 7 to the "OFF" position. Check that the actuator paddle is properly positioned. Check for continuity across MBC proximity switch. When MBC proximity switch is closed 0VDC is read across CB K8 connector pin #3 (GY wire) and CB K8 connector pin #4 (GY wire). 5VDC is present between CB K8 connector pin #3 (GY wire) or #4 (GY wire) to CB K5 connector, pin closest to CB K4 connector (5VDC gnd). If 5VDC is not present, replace CB.

CB monitors the following switches with 5VDC: Control Switch, GMPR (GMPR terminals 3 & 5), F/S, and MBC. A reading of 5VDC indicates that the switch is open.

7) **Fill Cycle** – "**WTRIN" LED is on**. Reservoir is empty and LF/S and UF/S are open. FT starts. WV energizes and fill cycle starts. LF/S closes. Nothing happens at this time. Reservoir continues to fill until UF/S closes. When UF/S closes, FT terminates and WV de-energizes. FZT and 30-second GM delay timer start. If UF/S remains open longer than 90 seconds after LF/S opens, FT exceeded and CB sounds a 1-beep alarm. WV remains energized until UF/S closes. Alarm resets automatically when UF/S closes. **Diagnosis:** If reservoir is empty and "WTRIN" LED is off, confirm LF/S status. See "IV.E. Float Switch Check and Cleaning." If LF/S is open and "WTRIN" LED is off, replace CB. If "WTRIN" LED is on, check that the reservoir fills. If not, check water supply line shut-off valve, water filters, and WV screen. If "WTRIN" LED is on and WV is off, check CB K2 connector pin #8 (W/BR wire) to a neutral (LBU wire) for 24VAC. If 24VAC is not present, check CB K2 connector pin #9 (W/R wire) to a neutral (LBU wire) for 24VAC. If 24VAC is present on CB K2 connector pin #9 and not on CB K2 connector pin #8, replace CB. If 24VAC is present on CB K2 connector pin #8 (W/BR wire), check continuity through WV solenoid. If open, replace WV. If WV is energized and refill exceeds FT with no water in the reservoir, check for DV leaking. If reservoir is full and overflowing check for open UF/S. See "IV.E. Float Switch Check and Cleaning." If UF/S is closed, check that WV de-energizes. If not, check CB K2 connector pin #8 (W/BR wire) to a neutral (LBU wire) for 24VAC. If 24VAC is present, replace CB. If WV de-energizes and water continues to fill the reservoir, replace WV.

8) **Ice Purge Cycle** – **"GM" LED is on**. 30-second GM delay timer terminates, GM, GMPR, and EH energize. 5-minute ice purge timer starts. **Diagnosis**: If "GM" LED is off, check that UF/S closes and WV de-energizes. If UF/S is closed, 30 seconds has passed, and "GM" LED remains off, replace CB. If "GM" LED is on and GM is off, check CB K1 connector pin #3 (BR wire) to a neutral (W wire) for 115VAC. If 115VAC is not present, check 115VAC power supply. If 115VAC is present, check CB K1 connector pin #2 (W/BK wire) to a neutral (W wire). If 115VAC is present on pin #3 and not on pin #2, replace CB. If 115VAC is present on pin #2, check GM fuse, GM internal protector, GM windings and capacitor, and GM coupling between auger and GM.

9) **Freeze Cycle** – **"COMP" and "GM" LEDs are on**. 5-minute ice purge timer terminates. GM, GMPR, and EH continue. PDS energizes. Once the refrigeration circuit low-side pressure reaches 29 PSIG, CLPS closes. MC energizes, allowing Comp and FMRs to energize. CCH de-energizes. Ice production starts 4 to 6 minutes after Comp energizes depending on ambient and water conditions. As ice is produced, the water level in the reservoir drops. UF/S opens. Nothing happens at this time. When LF/S opens, FZT terminates and FT starts.

FZT: 30-Minute Freeze Safety Timer – FZT starts when UF/S closes and terminates when LF/S opens. If LF/S does not open within 30 minutes of UF/S closing, CB shuts down the icemaker and sounds a 5-beep alarm. See "II.C.2. LED Lights and Audible Alarm Safeties." To reset, turn the power supply off and on again.

FS Diagnosis: Check that "COMP" LED is on and that PDS energizes. If "COMP" LED is off, check GMPR terminal #3 to GMPR terminal #5 (W/O wires) for 5VDC. If 5VDC is present, check GMPR terminal #7 (R wire) to GMPR terminal #8 (W wire) for 115VAC. If 115VAC is not present, replace CB. If 115VAC is present and GMPR contacts are open (5VDC present on GMPR terminals #3 and #5), check GMPR solenoid voltage and solenoid continuity. Replace GMPR if necessary. If "COMP" LED is on and PDS is not energized, check CB X1 relay BR wire to a neutral (W wire) and CB X1 relay DBU wire to a neutral (W wire) for 115VAC. If 115VAC is present on CB X1 BR wire and not on CB X1 DBU wire, replace CB. If 115VAC is present on CB X1 DBU wire and PDS is not energized, check for 115VAC at PDS (DBU wire) to a neutral (W wire) for 115VAC. If 115VAC is present and PDS is not energized, check PDS solenoid for continuity. If open or if PDS is sticking closed, replace PDS.

SRC Diagnosis: Confirm that CLPS closes. Once CLPS closes, MC energizes, energizing Comp and FMR. If not, check CLPS, SLPS (manual reset), and HPS (automatic reset).

CLPS: When PDS is energized, CLPS closes when refrigeration circuit low-side pressure reaches 29 PSIG. If CLPS is open, check that refrigeration circuit low-side pressure has reached 29 PSIG. If refrigeration circuit low-side pressure is too low, confirm proper TXV operation, check for refrigerant restrictions (drier, PDS), and correct refrigerant charge. Recover, evacuate, and recharge if necessary.

SLPS: If SLPS is open, manually reset SLPS. Confirm proper TXV operation, check for refrigerant restriction (drier, PDS), and correct refrigerant charge. Recover, evacuate, and recharge if necessary.

HPS: If HPS is open, HPS automatically resets when refrigeration circuit high-side pressure is within an acceptable range. If HPS does not reset (open), allow pressures to equalize and HPS to reset. If refrigeration circuit high-side pressure does not drop, recover, evacuate, and recharge if necessary. Before restarting unit, check for dirty or clogged condenser. Once unit is restarted, check for proper FMR operation and fan blade for binding. Check receiver, service valves, PDS, and drier for refrigeration circuit restriction. Also check for proper HM operation. If high-side refrigerant pressures have returned to an acceptable range and HPS does not close, replace HPS.
MC: If MC energizes and Comp does not energize, check MC L1 (BK wire) and MC L2 (BR wire) to a neutral (W wire) for 115VAC. If 115VAC is not present on either L1 or L2, check incoming power supply. If 115VAC is present on both L1 and L2 and Comp does not start, check MC T1 (BK wire) to MC T2 (R wire) for 208-230VAC. If 208-230VAC is not present, replace MC. If 208-230VAC is present, check Comp start relay, start capacitor, run capacitor, and Comp motor windings. If FMRs do not energize, check MC T3 (DBU wire) to a neutral (W wire) for 115VAC. If 115VAC is present and FMRs do not energize, check FM capacitors and motor windings. If 115VAC is not present, replace MC.

10) **Refill Cycle – "GM", "COMP", and "WTRIN" LEDs are on.**
LF/S and UF/S are open. WV energizes. GM, GMPR, EH, PDS, MC, Comp, and FMRs continue. LF/S closes. Nothing happens at this time. Reservoir continues to fill until UF/S closes. When UF/S closes, FT terminates and FZT starts. WV de-energizes. If UF/S remains open longer than 90 seconds after LF/S opens, FT exceeded and CB sounds a 1-beep alarm. WV remains energized until UF/S closes. Alarm resets automatically when UF/S closes.
Diagnosis – Confirm that the water level has dropped and the UF/S and LF/S are open. See "IV.E. Float Switch Check and Cleaning." Check that "WTRIN" LED is on. If LF/S is open and "WTRIN" LED is off, replace CB. If "WTRIN" LED is on, check that the reservoir fills. If not, check water supply line shut-off valve, water filters, and WV screen. If "WTRIN" LED is on and WV is off, check CB K2 connector pin #8 (W/BR wire) to a neutral (LBU wire) for 24VAC. If 24VAC is not present, check CB K2 connector pin #9 (W/R wire) to a neutral (LBU wire) for 24VAC. If 24VAC is present on CB K2 connector pin #9 and not on CB K2 connector pin #8, replace CB. If 24VAC is present on CB K2 connector pin #8 (W/BR wire), check continuity through WV solenoid. If open, replace WV. If WV is energized and refill exceeds FT with no water in the reservoir, check for DV leaking. If reservoir is full and overflowing check for open UF/S. See "IV.E. Float Switch Check and Cleaning." If UF/S is closed, check that WV de energizes. If not, check CB K2 connector pin #8 (W/BR wire) to a neutral (LBU wire) for 24VAC. If 24VAC is present, replace CB. If WV de-energizes and water continues to fill the reservoir, replace WV.
FT: 90-Second Low Water Safety Timer – When LF/S opens, 90-second low water safety timer starts. If UF/S does not close within 90 seconds after LF/S opens (FT exceeded), CB sounds a 1-beep alarm and a 90-second shutdown cycle starts. See "II.C.2. LED Lights and Audible Alarm Safeties." PDS de-energizes. Refrigeration circuit low-side pressure drops to 9 PSIG, opening CLPS. CLPS opens, de-energizing MC, which de-energizes Comp and FMRs. GM, GMPR, and EH continue. 90-second purge timer terminates, GM, GMPR, and EH de-energize. WV and 1-beep alarm continue until UF/S closes.

11) **Shutdown** – **Infrared Sensor:** When ice activates IS, yellow LED starts flashing when ice is at the outer limit of its range and turns steady as ice nears. After IS yellow LED turns on (flashing or steady), IS shutdown delay timer (S1 dip switch 1, 2, 3) starts. For a typical dispenser unit application, a 100-second shutdown delay is recommended. When used with a standard Hoshizaki storage bin, any shutdown delay setting is acceptable. See "II.C.3.b) Infrared Sensor Shutdown Delay (S1 dip switch 1, 2, 3)." Once IS shutdown delay timer terminates, PDS de-energizes and the 5-minute ice purge timer starts. Unit is in pump-down mode. When the refrigerant low-side pressure drops to 9 PSIG, CLPS opens, MC de-energizes, de-energizing Comp and FMRs. When the 5-minute ice purge timer terminates, GM, GMPR, and EH de-energize.
Note: If IS fails to shut down the icemaker, MBC opens, CB shuts down the icemaker and sounds a 9-beep alarm.
Mechanical Backup Bin Control: MBC opens (actuator paddle engaged). CB shuts down the icemaker within 10 seconds and sounds a 9-beep alarm.
Diagnosis: See "IV.D. Bin Control Check."

Legend: **CB**–control board; **CCH**–crankcase heater; **CLPS**–control low-pressure switch; **Comp**–compressor; **DV**–drain valve; **EH**–evaporator heater; **FMRs**–fan motors-remote; **FT**–fill timer (90-second low water safety timer); **FZT**–freeze timer (30-minute freeze safety timer); **GM**–gear motor; **GMPR**–gear motor protect relay; **GMR**–gear motor relay; **HM**–headmaster; **HPS**–high-pressure switch; **IS**–infrared sensor; **LF/S**–lower float switch; **MC**–magnetic contactor; **MBC**–mechanical backup bin control; **PDS**–pump-down solenoid valve; **SLPS**–safety low-pressure switch; **UF/S**–upper float switch; **WV**–inlet water valve

C. Control Board Check

Before replacing a control board that does not show a visible defect and that you suspect is bad, always conduct the following check procedure. This procedure will help you verify your diagnosis. Before proceeding, check for proper voltage per unit nameplate. Check that the 24VAC 1A fuse and the 115VAC 7A GM fuse are good. When checking for high-voltage (115VAC), always choose a neutral (W wire) to establish a good neutral connection. When checking for low-voltage (secondary) (24VAC), always choose a neutral (LBU wire) to establish a good neutral connection. If the icemaker is in alarm, see "II.C.2. LED Lights and Audible Alarm Safeties."

Note: EH energizes when "GM" LED turns on. CB X1 Comp relay energizes PDS. Refrigeration circuit low-side pressure reaches 29 PSIG, closing CLPS contacts. MC is energized when CLPS closes, energizing Comp and FMRs.

1) Check the S1 dip switch settings to assure that they are in the factory default position. For factory default settings, see "II.C.3.a) Default Dip Switch Settings." S1 dip switch 7 determines bin control application:

   Bin Control Application:
   Infrared Sensor Bin Control with Mechanical Backup Bin Control: S1 dip switch 7 in the "ON" position.
   Mechanical Bin Control (Standard Ice Storage Bin): S1 dip switch 7 in the "OFF" position.

2) **Startup – "POWER OK" LED on:** Move the control switch to the "ICE" position, then move the power switch to the "ON" position. The CB green "POWER OK" LED turns on. **Diagnosis "POWER OK" LED**: Check that the CB green "POWER OK" LED is on. If not, check for 24VAC from CB K8 connector pin #1 (W/R wire) to CB K8 connector pin #2 (LBU wire). If 24VAC is present and CB green "POWER OK" LED is off, replace CB.

3) **IS Power Supply:** CB supplies 20VDC to IS. **Diagnosis:** Check that IS green LED is on. If IS green LED is not on, check for 20VDC between CB connector K6 pin #1 (DBU wire) and connector K6 pin #3 (BR wire). See Fig. 1. If 20VDC is not present, replace CB.

Infrared Sensor (20VDC)
Closed
20VDC Pin #1 (DBU) to Pin #3 (BR)
20VDC Pin #1 (DBU) to Pin #2 (W)
0VDC Pin #2 (W) to Pin #3 (BR)

Infrared Sensor (20VDC)
Open (IS yellow LED flashing or steady)
20VDC Pin #1 (DBU) to Pin #3 (BR)
0VDC Pin #1 (DBU) to Pin #2 (W)
20VDC Pin #2 (W) to Pin #3 (BR)

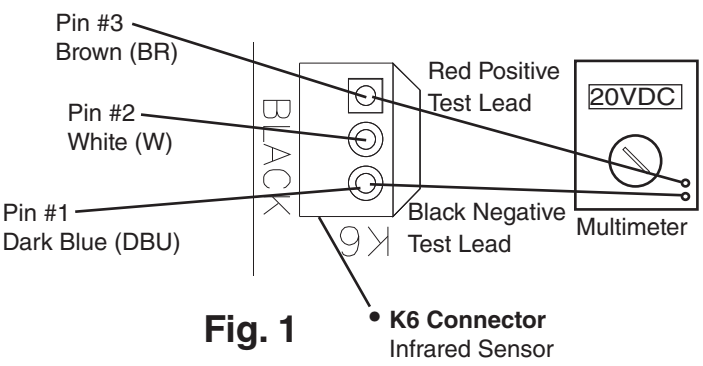


Fig. 1

4) **5VDC Output Checks:** Control Switch (open contacts for icemaking, closed contacts for drain), GMPR (terminals #3 & 5), MBC, and F/S. When checking 5VDC control voltage, always place the red positive test lead from the multimeter to the CB white K5 connector pin closest to the CB red K4 connector. See Fig. 2. Then place the black negative test lead from the multimeter to the corresponding pin to complete the 5VDC check.

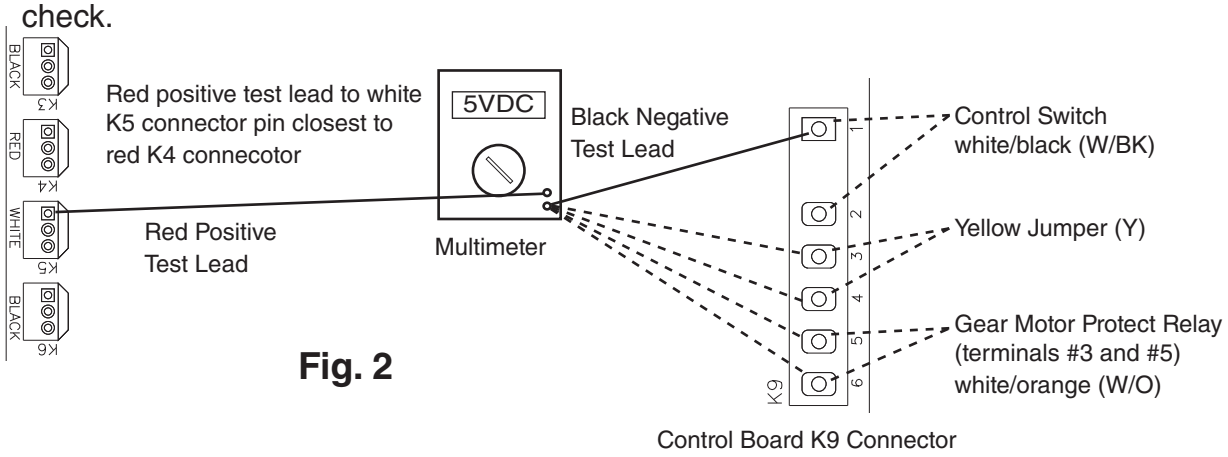


Fig. 2

a. Control Switch – CB K9 connector pins #1 and #2 (W/BK wires): 5VDC is present from CB white K5 connector, pin closest to CB red K4 connector to CB K9 connector pin #1 (W/BK wire) at all times. If 5VDC is not present, replace CB. When the control switch is in the "ICE" position, the control switch contacts are open. 0VDC is present from CB white K5 connector pin closest to CB red K4 connector to CB K9 connector pin #2 (W/BK wire). When in the "ICE" position, 5VDC is present from CB K9 connector pin #1 (W/BK wire) to CB K9 connector pin #2 (W/BK wire). When the control switch is in the "DRAIN" position, the control switch contacts are closed. 5VDC is present from CB white K5 connector pin closest to CB red K4 connector to CB K9 connector pins #1 or #2 (W/BK wires). If 5VDC is not present, replace CB. 0VDC is present from CB K9 connector pin #1 (W/BK wire) to CB K9 connector pin #2 (W/BK wire).

b. Gear Motor Protect Relay (GMPR) – CB K9 connector pins #5 and #6 (W/O wires): When GMPR terminals #3 and #4 are open (GMPR de-energized), 5VDC is present from CB white K5 connector, pin closest to CB red K4 connector, to CB K9 connector pin #5 (W/O wire). If 5VDC is not present, replace CB. When GMPR terminals #3 and #4 are closed (GMPR energized), 5VDC is present from CB white K5 connector pin closest to CB red K4 connector to CB K9 connector pins #5 and #6 (W/O wires). Also check from CB K9 connector pin #5 (W/O wire) to CB K9 connector pin #6 (W/O wire). If 0VDC is present, GMPR terminals #3 & #5 are closed. If 5VDC is present, GMPR terminals #3 & #5 are open and CB may be in an 8-beep alarm. See "II.C.2. LED Lights and Audible Alarm Safeties."

c. Mechanical Backup Bin Control (MBC) – CB K8 connector pins #3 and #4 (GY wires): When MBC is closed (calling for ice), 5VDC is present from CB white K5 connector, pin closest to CB red K4 connector, to CB K8 connector pin #3 and #4 (GY wires). **Diagnosis:** If 5VDC is not present to either pin, replace CB. If 5VDC is present to pin #3 (GY wire) and not to pin #4 (GY wire), MBC is open. See "IV.D.2. Mechanical Backup Bin Control Check."

d. Float Switch (LF/S and UF/S) – CB K8 connector pin #5 (BK wire) (common), #6 (R wire) (upper), and #7 (DBU wire) (lower): 5VDC is always present from CB white K5 connector pin closest to CB red K4 connector to CB K8 connector pin #5 (BK wire) (common). 5VDC is present to CB K8 connector pin #6 (R wire) (upper) and pin #7 (DBU wire) (lower) when the F/S is open. **Diagnosis:** If 5VDC is not present at CB K8 connector pin #5 (BK wire), replace CB. For further F/S diagnostics, see "IV.E. Float Switch Check and Cleaning."

5) **Fill "WTRIN" LED is on:** When LF/S opens, FZT terminates, FT starts, and the "WTRIN" LED turns on. The "WTRIN" LED turns off once UF/S closes. 24VAC is present at CB K2 connector pin #8 (W/BR wire) to any neutral (LBU wire) when LF/S is open. **Diagnosis:** If LF/S is open and "WTRIN" LED is off, confirm LF/S status. See "IV.E. Float Switch Check and Cleaning." If LF/S is open and "WTRIN" LED is off, replace CB. If "WTRIN" LED is on and 24VAC is not present from CB K2 connector pin #8 (W/BR wire) to a neutral (LBU wire), confirm 24VAC from CB K2 connector pin #9 (W/R wire) to a neutral (LBU wire). If 24VAC is present on CB K2 connector pin #9 and not on CB K2 connector pin #8, replace CB.

6) **Ice Purge Cycle "GM" LED is on:** "GM" LED is on, GM and EH energize. **Diagnosis:** If "GM" LED is on and GM and EH are off, check for 115VAC from CB K1 connector pin #2 (W/BK wire) to a neutral (W wire). If 115VAC is not present, check for 115VAC from CB K1 connector pin #3 (BR wire) to a neutral (W wire). If 115VAC is present on pin #3 and not on pin #2, replace CB.

7) **Freeze Cycle "GM" and "COMP" LED are on:** To bypass the Ice Purge Cycle, press the "SERVICE" button on CB after the "GM" LED turns on. **WARNING! Risk of electric shock. Care should be taken not to touch live terminals.** When "COMP" LED is on, 115VAC is present between CB X1 relay dark blue (DBU) wire and a neutral (W wire). PDS energizes. **Diagnosis:** Check for 115VAC from CB X1 relay dark blue (DBU wire) to a neutral (W wire). If 115VAC is not present, check X1 relay brown (BR wire) to a neutral (W wire). If 115VAC is present on X1 relay brown (BR wire) and not on X1 relay dark blue (DBU wire), replace CB.

8) **Refill "WTRIN" LED is on:** See "5) Fill "WTRIN" LED is on:") above.

Legend: **CB**–control board; **EH**–evaporator heater; **F/S**–float switch; **FT**–fill timer (90-second low water safety timer); **FZT**–freeze timer (30-minute freeze safety timer); **GM**–gear motor; **GMPR**–gear motor protect relay; **IS**–infrared sensor; **LF/S**–lower float switch; **MBC**–mechanical backup bin control; **PDS**–pump-down solenoid valve; **UF/S**–upper float switch; **WV**–inlet water valve

D. Bin Control Check

1. Infrared Sensor Check

IMPORTANT
Make sure S1 dip switch 7 is in the "ON" position. This allows the control board to monitor the infrared sensor along with the mechanical backup bin control.

1) Remove the front panel.
2) Move the power switch to the "OFF" position, then unplug the unit from the electrical outlet.
3) Remove the control box cover and access CB. Confirm that S1 dip switch 1, 2, 3 are in the proper position for your application. See "II.C.3.b) Infrared Sensor Shutdown Delay (S1 dip switch 1, 2, 3)."
4) Confirm that IS is connected to CB K6 connector. Wipe down the IS lens with a clean, warm, damp cloth. If the bottom of the icemaker is not accessible in your application, remove the thumbscrew securing the IS housing, then remove the housing from the base. See Fig. 3.
5) Make sure the control switch is in the "ICE" position, then plug the icemaker into the electrical outlet.
6) Move the power switch to the "ON" position to start the automatic icemaking process. Check that the IS green LED is on. The IS green LED confirms 20VDC from CB to IS and remains on constantly. **Diagnosis:** If the IS green LED is not on, confirm 20VDC at CB K6 connector pin #1 (DBU wire) to CB K6 connector pin #3 (BR wire). If 20VDC is present and the IS green LED is off, replace IS. If not, see step "3) IS Power Supply," under "IV.C. Control Board Check."
7) Make sure CB "GM" LED is on. There is a delay of at least 30 seconds before CB "GM" LED turns on after power-up. After CB "GM" LED turns on, press CB "SERVICE" button to bypass the 5-minute ice purge cycle. **WARNING! Risk of electric shock. Care should be taken not to touch live terminals.**
8) "GM" and "COMP" LEDs are on. Use an object to cover IS lens. The IS yellow LED on IS turns on (flashing or steady). The IS yellow LED flashes when ice is at the outer limit of its range and turns steady as ice nears. After the IS yellow LED turns on (flashing or steady), IS shutdown delay timer starts . See "II.C.3.b)Infrared Sensor Shutdown Delay (S1 dip switch 1, 2, 3)." Comp and FMRs should de-energize immediately after the shutdown delay timer terminates. Five minutes later, GM should de-energize. **Diagnosis:** If the IS yellow LED is not on after covering the lens, replace IS. If the unit remains on after IS shutdown delay timer terminates and the 5-minute ice purge timer terminates, replace CB. If IS fails to shut down the icemaker and the level of ice activates MBC, the icemaker shuts down within 10 seconds of MBC opening and a 9-beep alarm sounds. To reset, move the power switch to the "OFF" position, and then back to the "ON" position.

9) Remove the object covering IS. If you removed IS housing from the base, replace it in its correct position, and secure it with the thumbscrew.

10) Move the power switch to the "OFF" position. Unplug the icemaker from the electrical outlet, then proceed to "IV.D.2. Mechanical Backup Bin Control Check."

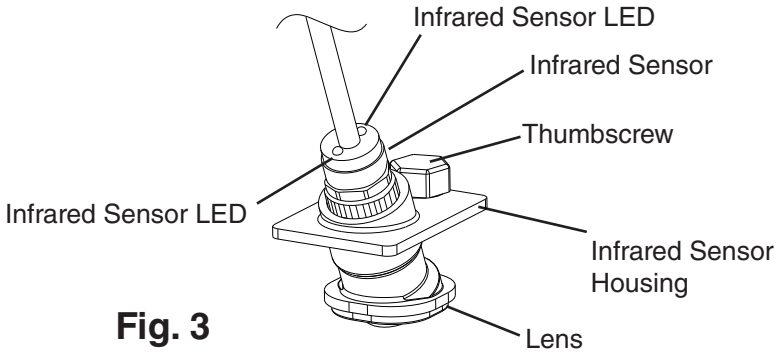


Fig. 3

2. Mechanical Backup Bin Control Check

When the actuator paddle is not engaged MBC is closed and the icemaker produces ice.

a) Mechanical Backup Bin Control: S1 dip switch 7 placed in the "ON" position, MBC is used as a backup bin control safety. When ice fills the chute and engages the actuator paddle, MBC opens and CB shuts down the icemaker within 10 seconds and sounds a 9-beep alarm.

b) Stand-Alone Mechanical Bin Control: S1 dip switch 7 placed in the "OFF" position, MBC is used as a stand-alone bin control. The stand-alone application should only be used in Hoshizaki standard ice storage bin applications. **WARNING! Do not place S1 dip switch 7 in the "OFF" position on dispenser unit applications.** When ice fills the chute and engages the actuator paddle, MBC opens and CB shuts down the icemaker within 10 seconds.

1) Remove the front panel.

2) Move the power switch to the "OFF" position, then unplug the unit from the electrical outlet.

3) Remove the strap connecting the spout to the chute assembly. See Fig. 4. Pull up the chute assembly slightly so that you can access the actuator paddle located in the top of the chute.

4) Plug the unit into the electrical outlet.

5) Move the power switch to the "ON" position to start the automatic icemaking process.

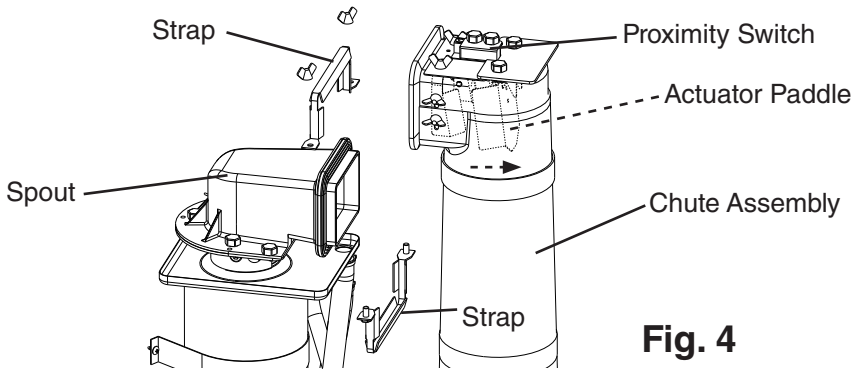


Fig. 4

6) Make sure CB "GM" LED is on. There is a delay of at least 30 seconds before CB "GM" LED turns on after power-up. After CB "GM" LED turns on, press CB "SERVICE" button to bypass the 5-minute ice purge cycle. **WARNING! Risk of electric shock. Care should be taken not to touch live terminals.** CB "COMP" LED turns on.

7) Press the actuator paddle located in the top of the chute.
S1 dip switch 7 in the "ON" position: Comp and GM de-energizes within 10 seconds and CB sounds a 9-beep alarm. **S1 dip switch 7 in the "OFF" position:** Comp and GM de-energize within 10 seconds. **Diagnosis:** If MBC does not open or the icemaker continues to make ice, check that the actuator paddle is moving freely. Confirm that the actuator paddle is engaged. Check for continuity across MBC wires. If MBC contacts are found open and the icemaker continues to make ice, CB is bad and must be replaced. If MBC is closed with the actuator paddle engaged, MBC is bad and must be replaced.

8) Move the power switch to the "OFF" position, then unplug the unit from the electrical outlet.

9) Replace the chute assembly and strap in their correct positions.

10) Replace the control box cover and top panel in their correct positions.

11) Plug the unit into the electrical outlet.

12) Move the power switch to the "ON" position to start the automatic icemaking process.

13) Replace the front panel in its correct position.

Legend: **CB**–control board; **Comp**–compressor; **GM**–gear motor; **IS**–infrared sensor; **MBC**–mechanical backup bin control

E. Float Switch Check and Cleaning

1. Float Switch Check

1) Remove the front panel, then move the power switch to the "OFF" position.
2) Move the control switch to the "DRAIN" position.
3) Move the power switch to the "ON" position.
4) Allow the water to drain from the evaporator, then move the power switch to the "OFF" position and the control switch to the "ICE" position.
5) Unplug the unit from the electrical outlet.
6) Remove the control box cover.
7) Remove CB K8 connector and check F/S continuity. Both the UF/S and LF/S should be open. Check continuity between CB K8 connector pin #5 (BK wire) (common) and CB K8 connector pin #6 (R wire) (UF/S). Next, check continuity between CB K8 connector pin #5 (BK wire) (common) and CB K8 connector pin #7 (DBU wire) (LF/S). If both are open, continue to step 5. If either are closed, follow the steps in "IV.E.2. Float Switch Cleaning." After cleaning F/S, check UF/S and LF/S again. Replace if necessary.
8) Replace CB K8 connector in its correct position.
9) Plug the unit into the electrical outlet, then move the power switch to the "ON" position and let the water reservoir fill.
10) Once the reservoir is full and GM starts, move the power switch to the "OFF" position.
11) Unplug the unit from the electrical outlet.
12) Remove CB K8 connector and check F/S continuity. Both the UF/S and LF/S should be closed. Check continuity between CB K8 connector pin #5 (BK wire) (common) and CB K8 connector pin #6 (R wire) (UF/S). Next, check continuity between CB K8 connector pin #5 (BK wire) (common) and CB K8 connector pin #7 (DBU wire) (LF/S). If either are open, follow the steps in "IV.E.2. Float Switch Cleaning." After cleaning F/S, check UF/S and LF/S again. Replace if necessary.
13) Replace CB K8 connector in its correct position. Replace the control box cover in its correct position.
14) Plug the unit into the electrical outlet, then move the power switch to the "ON" position to start the automatic icemaking process.
15) Replace the front panel in its correct position.

2. Float Switch Cleaning

Depending on local water conditions, scale may build up on F/S. Scale on F/S can cause inconsistent operation of UF/S and LF/S. In this case, both UF/S and LF/S should be cleaned and checked.

1) Remove the front panel, then move the power switch to the "OFF" position.
2) Unplug the unit from the electrical outlet.
3) Remove F/S assembly from the reservoir cover. See Fig. 5.

4) Wipe down F/S assembly with a mixture of 1 part Hoshizaki "Scale Away" and 25 parts warm water. Rinse the assembly thoroughly with clean water.

5) While not necessary, the floats can be removed from the shaft during cleaning. If you remove them, note that the blue float is on top (UF/S) and the white float is on bottom (LF/S). The floats must be installed with the magnets inside them towards the top of the switch. See Fig. 6. Installing the floats upside down will affect the timing of F/S operation.

6) Rinse the float switch assembly thoroughly with clean water and replace in its correct position.

7) Plug the unit into the electrical outlet, then move the power switch to the "ON" position to start the automatic icemaking process.

8) Replace the front panel in its correct position.

Legend: **CB**–control board; **F/S**–float switch; **GM**–gear motor; **LF/S**–lower float switch; **UF/S**–upper float switch

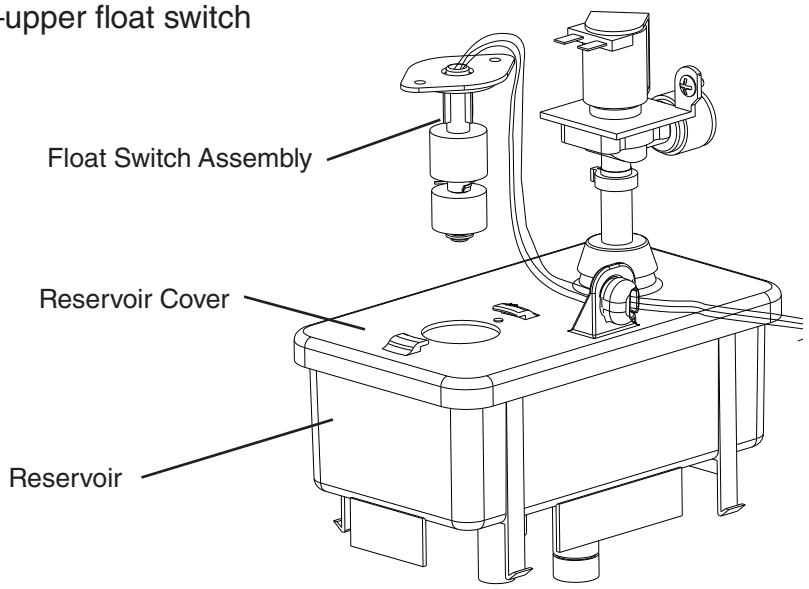


Fig. 5

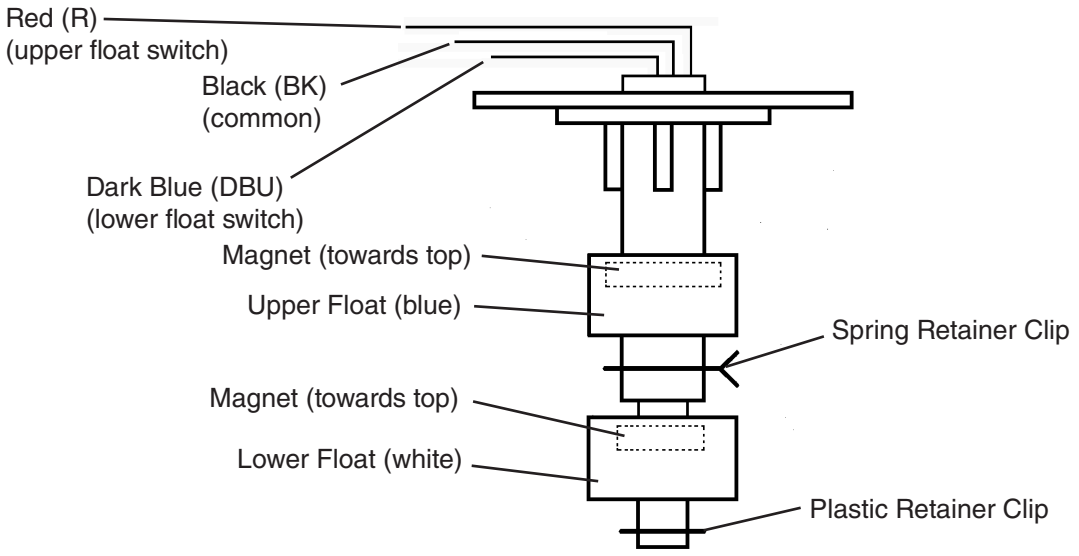


Fig. 6

F. Diagnostic Charts

Before consulting the diagnostic charts, check for correct installation, proper voltage per unit nameplate, and adequate water pressure (10 to 113 PSIG). Check CB using the steps in "IV.C. Control Board Check." Check the dip switch settings to assure that S1 dip switch settings are in the factory default position. For factory default settings, see "II.C.3.a) Default Dip Switch Settings."

1. No Ice Production

No Ice Production - Possible Cause	
Startup	
1a. Power Supply-FS	a) Unplugged, off, blown fuse, or tripped breaker.
	b) Not within specifications.
1b. Power Supply-SRC	a) Off, tripped breaker.
	b) Not within specifications.
2. Water Supply	a) Water supply off or improper water pressure.
	b) External water filters clogged.
3. Power Switch	a) "OFF" position.
4. Control Transformer (115VAC/24VAC)	a) Coil winding open or shorted.
5. 1A Fuse (FS Control Box)	a) Blown.
6. Control Board See "IV.C. Control Board Check"	a) In alarm.
	b) BC OPEN, IS yellow LED on (bin full).
	c) Defective.
7. Control Switch	a) In "DRAIN" position.
	b) Bad contacts.
8. Infrared Sensor Bin Control	a) No power, lens dirty, or defective.
	b) Control board dip switch 7 off.
9. Mechanical Backup Bin Control	a) Tripped with bin filled with ice (9-beep alarm).
	b) Proximity switch stuck open.
	c) Actuator paddle does not move freely.
Fill Cycle	
1. Control Board	a) No power to inlet water valve.
	b) No power to float switch or not reading float switch condition.
2. Inlet Water Valve	a) Screen or orifice clogged.
	b) Coil winding open.
3. Float Switch See "IV.E. Float Switch Check and Cleaning"	a) Float does not move freely.
	b) Defective.
Ice Purge Cycle	
1. Control Board	a) No power to gear motor.
	b) No power to gear motor protect relay circuit.
2. Gear Motor	a) Blown fuse.
	b) Internal protector open.
	c) Gear motor winding open.
	d) Mechanical failure.

No Ice Production - Possible Cause	
Ice Purge Cycle Continued	
3. Gear Motor Protect Relay	a) Open windings.
	b) Contacts stuck open.
Freeze Cycle	
1. Gear Motor Protect Relay	a) Open.
2. Control Board	a) No power to pump-down solenoid valve.
	b) X1 relay defective.
3. Pump-Down Solenoid Valve	a) Open coil.
	b) Sticking.
4. Magnetic Contactor	a) Open coil.
	b) Contacts sticking.
5. Control Low-Pressure Switch	a) Refrigerant pressure too low.
	b) Out of adjustment or defective.
6. Safety Low-Pressure Switch (manual reset)	a) Refrigerant pressure too low.
	b) Defective.
7. High-Pressure Switch	a) Dirty condenser.
	b) Ambient temperature too warm.
	c) Fan motor not operating.
	d) Refrigerant overcharged.
	e) Bad contacts.
	f) Refrigerant lines or components restricted.
8. Condensing Unit Fan Motor	a) Magnetic contactor contacts bad or coil winding open.
	b) Motor winding open.
	c) Bearing worn out or locked rotor.
	d) Capacitor defective.
9. Compressor	a) Magnetic contactor contacts bad or coil winding open.
	b) Motor winding open.
	c) Start capacitor or run capacitor defective.
	d) Start relay contacts bad or coil winding open.
10. Evaporator	a) Dirty.
	b) Damaged or defective.
11. Expansion Valve (TXV)	a) Bulb loose.
	b) Operating erratically.
12. Refrigerant Charge	a) Low.
13. Drain Valve	a) Dirty, leaking by.
	b) Defective coil.
	c) Defective control board.
14. Water System	a) Water leaks.

No Ice Production - Possible Cause	
Refill	
1. Float Switch	a) Dirty/sticking.
	b) Defective.
2. Inlet Water Valve	a) Clogged or defective.
3. Water Supply	a) Off.
4. Control Board	a) No power to float switch or not reading float switch condition.
	b) No power to inlet water valve.
Shutdown	
1. Infrared Sensor Bin Control	a) Dirty lens.
	b) Defective.
	c) Control board (no power to IS).
2. Mechanical Backup Bin Control	a) Tripped with bin filled with ice (9-beep alarm).
	b) Proximity switch stuck closed.
	c) Actuator paddle does not move freely.
	d) Control board dip switch failure.
3. Pump-Down Solenoid Valve	a) Defective (stuck open).
4. Control Low-Pressure Switch	a) Defective (stuck closed).
5. Magnetic Contactor	a) Contacts stuck closed.
6. Control Board	a) No power to IS.
	b) X1 relay defective.
	c) In alarm.

V. Removal and Replacement of Components

⚠ WARNING

- This unit should be diagnosed and repaired only by qualified service personnel to reduce the risk of death, electric shock, serious injury, or fire.
- Move the power switch to the "OFF" position and unplug the icemaker from the electrical outlet and turn off the power supply to the condensing unit before servicing. Lockout/Tagout to prevent the power from being turned back on inadvertently.
- **CHOKING HAZARD:** Ensure all components, fasteners, and thumbscrews are securely in place after the equipment is serviced. Make sure that none have fallen into the dispenser unit/storage bin.
- Make sure all food zones in the icemaker and dispenser unit/storage are clean after the unit is serviced. For cleaning procedures, see "VI. Cleaning and Maintenance."
- When replacing evaporator assembly and water circuit components, make sure there are no water leaks after the repair is complete.

A. Service for Refrigerant Lines

⚠ WARNING

- Repairs requiring the refrigeration circuit to be opened must be performed by properly trained and EPA-certified service personnel.
- Always recover the refrigerant and store it in an approved container. Do not discharge the refrigerant into the atmosphere.
- Use an electronic leak detector or soap bubbles to check for leaks. Add a trace of refrigerant to the system (if using an electronic leak detector), and then raise the pressure using nitrogen gas (140 PSIG). DO NOT use R-404A as a mixture with pressurized air for leak testing.

NOTICE

- Do not leave the system open for longer than 15 minutes when replacing or servicing parts. The Polyol Ester (POE) oils used in R-404A units can absorb moisture quickly. Therefore it is important to prevent moisture from entering the system when replacing or servicing parts.
- Always install a new drier every time the sealed refrigeration system is opened.
- Do not replace the drier until after all other repair or replacement has been made. Install the new drier with the arrow on the drier in the direction of the refrigerant flow.
- When brazing, protect the drier by using a wet cloth to prevent the drier from overheating. Do not allow the drier to exceed 250°F (121°C).

1. Refrigerant Recovery

The icemaker unit is provided with refrigerant service valves. Using proper refrigerant practices, recover the refrigerant from the service valves and store it in an approved container. Do not discharge the refrigerant into the atmosphere.

2. Brazing

⚠ WARNING

- R-404A itself is not flammable at atmospheric pressure and temperatures up to 176°F (80°C).
- R-404A itself is not explosive or poisonous. However, when exposed to high temperatures (open flames), R-404A can be decomposed to form hydrofluoric acid and carbonyl fluoride both of which are hazardous.
- Do not use silver alloy or copper alloy containing arsenic.
- Use an electronic leak detector or soap bubbles to check for leaks. Add a trace of refrigerant to the system (if using an electronic leak detector), and then raise the pressure using nitrogen gas (140 PSIG). DO NOT use R-404A as a mixture with pressurized air for leak testing.

1) Braze all fittings while purging with nitrogen gas flowing at a pressure of 3 to 4 PSIG.

NOTICE

- Always install a new drier every time the sealed refrigeration system is opened.
- Do not replace the drier until after all other repair or replacement has been made. Install the new drier with the arrow on the drier in the direction of the refrigerant flow.
- When brazing, protect the drier by using a wet cloth to prevent the drier from overheating. Do not allow the drier to exceed 250°F (121°C).

2) Use an electronic leak detector or soap bubbles to check for leaks. Add a trace of refrigerant to the system (if using an electronic leak detector), and then raise the pressure using nitrogen gas (140 PSIG). DO NOT use R-404A as a mixture with pressurized air for leak testing.

3. Evacuation and Recharge (R-404A)

1) Attach a vacuum pump to the system. Be sure to connect charging hoses to both high and low-side service valves.

IMPORTANT

The vacuum level and vacuum pump may be the same as those for current refrigerants. However, the rubber hose and gauge manifold to be used for evacuation and refrigerant charge should be exclusively for POE oils.

2) Turn on the vacuum pump. Open the gauge manifold valves, then open the high and low-side service valves. Never allow the oil in the vacuum pump to flow backwards.

3) Allow the vacuum pump to pull down to a 29.9" Hg vacuum. Evacuating period depends on pump capacity.

4) Close the low-side valve and high-side valve on the gauge manifold.

5) Disconnect the gauge manifold hose from the vacuum pump and attach it to a refrigerant service cylinder. Remember to loosen the connection and purge the air from the hose. See the rating label inside the icemaker for the required refrigerant charge. Hoshizaki recommends only virgin refrigerant or reclaimed refrigerant which meets ARI Standard 700 (latest edition) be used.

6) A liquid charge is required for charging an R-404A system (to prevent fractionation). Place the service cylinder on the scales: if the service cylinder is not equipped with a dip tube, invert the service cylinder, then place it on the scales. Open the high-side valve on the gauge manifold.

7) Allow the system to charge with liquid until the proper charge weight is met.

8) If necessary, add any remaining charge to the system through the low-side. ***NOTICE!*** **To prevent compressor damage, use a throttling valve or liquid dispensing device to add the remaining liquid charge through the low-side service valve with the unit running.**

9) Close the high and low-side service valves. Close the high and low-side gauge manifold valves, then disconnect the gauge manifold hoses.

10) Cap the service valves to prevent a possible leak.

B. Important Notes for Component Replacement

NOTICE
When replacing a component listed below, see the notes to help ensure proper operation.

Component	Notes
Compressor	• Install a new drier, start capacitor, run capacitor, and start relay.
Expansion Valve	• Install a new drier. • Attach the expansion valve bulb to the suction line in the same location as the previous bulb. • The bulb should be between the 10 and 2 o'clock positions on the tube. • Secure the bulb with the clamp and holder, then insulate it.
Pump-Down Solenoid Valve	• Install a new strainer and drier. • Use copper tube of the same diameter and length when replacing valve lines.
Fan Motor	• Install a new fan motor capacitor.
Evaporator Assembly Components. See Fig. 7.	
Upper and Lower Bearings	• Inspect the upper bearing for wear. See "V.B.1. Upper Bearing Wear Check." Replace if necessary. • When replacing the upper bearing it is advised to also change the lower bearing at the same time.
Evaporator	• Install a new drier. • Inspect the mechanical seal and O-ring prior to installing the new evaporator. If worn, cracked, or scratched, the mechanical seal should also be replaced.
Gear Motor	• Install a new gear motor capacitor.

Evaporator Assembly

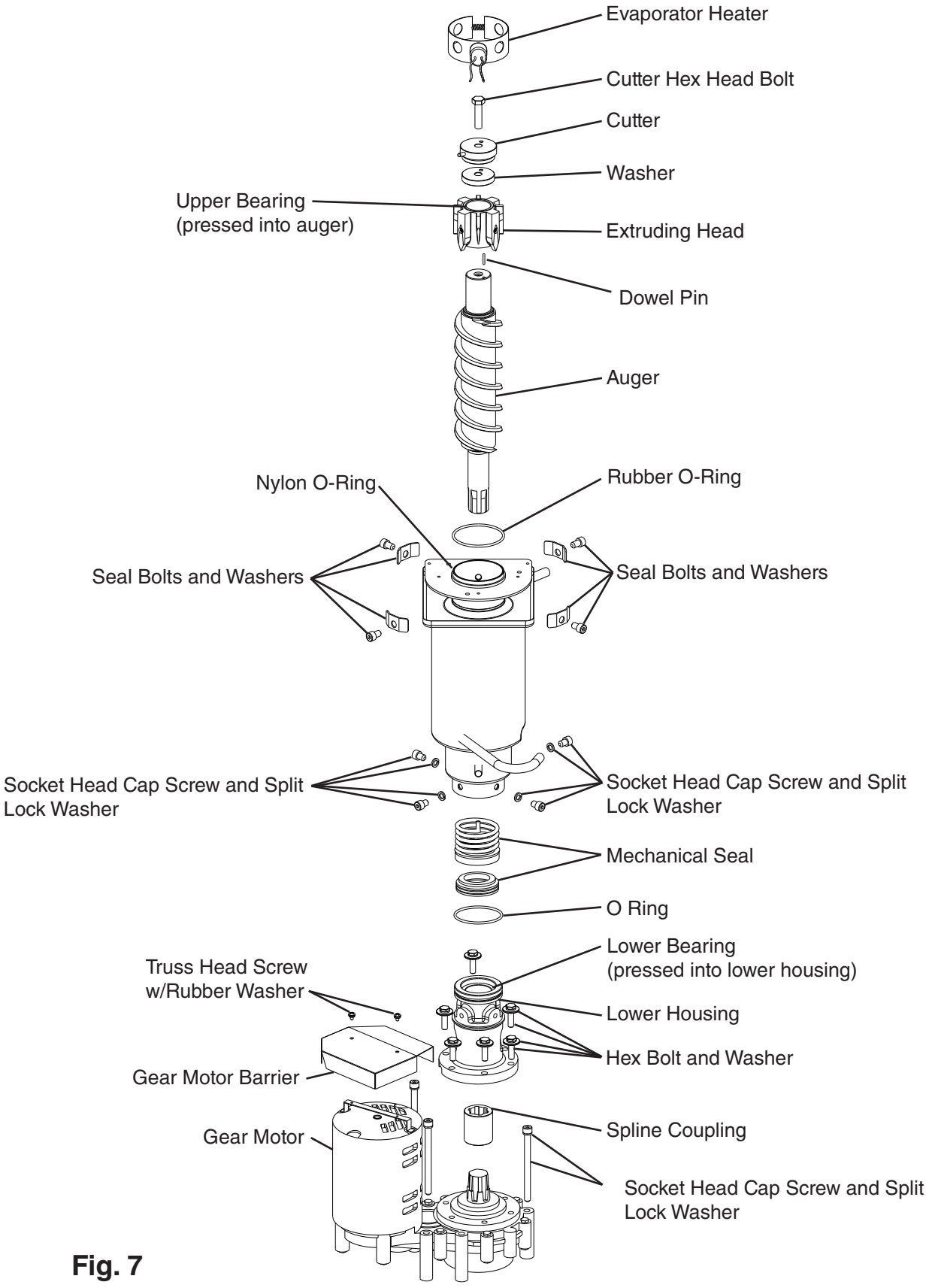


Fig. 7

1. Upper Bearing Wear Check

To ensure that the bearing inside the extruding head does not exceed the wear tolerance of .02", follow the instructions below.

1) Remove the front panel. Move the power switch to the "OFF" position, then unplug the unit from the electrical outlet.

2) Remove the top and side panels.

3) Remove the strap connecting the spout to the chute assembly, then remove the spout.

4) Remove the bolt from the auger and lift off the cutter and washer.

5) Replace the bolt in the auger. Grasp the bolt at the top of the auger and move the auger towards you and then try to insert a .02" round stock or pin gauge in between the back side of the auger shaft and the bearing surface. Check several locations around the auger shaft. If the gauge goes between the shaft and the bearing at any point or if the bearing is scratched or cracked, both the top bearing in the extruding head and the lower bearing in the lower housing should be replaced. Instructions for removing the extruding head and lower housing are located later in this procedure.

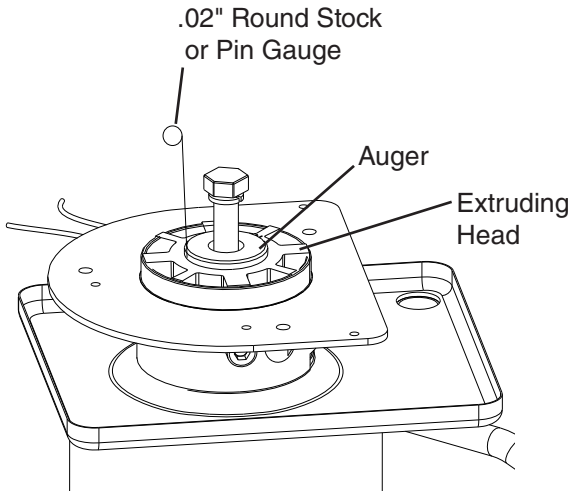


Fig. 8

Note: Replacing the bearing requires a bearing press adaptor. If one is not available, replace the whole extruding head and lower housing.

6) Remove the bolt. Replace the washer, cutter, and cutter bolt.

7) Replace the spout.

8) Replace the top and side panels in their correct positions.

9) Plug the unit into the electrical outlet, then move the power switch to the "ON" position to start the automatic icemaking process.

10) Replace the front panel in its correct position.

2. Removal and Replacement of Cutter

1) Remove the front panel. Move the power switch to the "OFF" position, then unplug the unit from the electrical outlet.

2) Remove the top and side panels.

3) Remove the strap connecting the spout to the chute assembly, then remove the spout.

4) Remove the bolt and lift off the cutter.

5) Install the new cutter. Replace the bolt.

6) Replace the spout.

7) Replace the top and side panels in their correct positions.

8) Plug the unit into the electrical outlet, then move the power switch to the "ON" position to start the automatic icemaking process.

9) Replace the front panel in its correct position.

3. Removal and Replacement of Extruding Head

1) Remove the front panel, then move the power switch to the "OFF" position.

2) Move the control switch to the "DRAIN" position.

3) Move the power switch to the "ON" position.

4) Allow the water to drain from the evaporator.

5) Move the power switch to the "OFF" position, then unplug the unit from the electrical outlet.

6) Remove the top and side panels.

7) Remove the strap connecting the spout to the chute assembly, then remove the spout.

8) Remove the cutter bolt and lift off the cutter and washer.

9) Remove the seal bolts and lift off the extruding head.

10) Place the new extruding head in place and tighten down the seal bolts.

11) Replace the washer, cutter, cutter bolt, and spout.

12) Replace the top and side panels in their correct positions.

13) Move the control switch to the "ICE" position.

14) Plug the unit into the electrical outlet, then move the power switch to the "ON" position to start the automatic icemaking process.

15) Replace the front panel in its correct position.

4. Removal and Replacement of Auger

1) Remove the front panel, then move the power switch to the "OFF" position.

2) Move the control switch to the "DRAIN" position.

3) Move the power switch to the "ON" position.

4) Allow the water to drain from the evaporator.

5) Move the power switch to the "OFF" position, then unplug the unit from the electrical outlet.

6) Remove the top and side panels.

7) Remove the strap connecting the spout to the chute assembly, then remove the spout.

8) Remove the extruding head seal bolts. Using the cutter, lift out the auger assembly.

9) Remove the cutter bolt, cutter, washer, and dowel pin. Remove the extruding head from the auger and place on the new auger.

10) Install the new auger.

11) Replace the removed parts in the reverse order of which they were removed.

12) Replace the top and side panels in their correct positions.

13) Move the control switch to the "ICE" position.

14) Plug the unit into the electrical outlet, then move the power switch to the "ON" position to start the automatic icemaking process.

15) Replace the front panel in its correct position.

5. Removal and Replacement of Evaporator

NOTICE
• Always install a new drier every time the sealed refrigeration system is opened. • Do not replace the drier until after all other repair or replacement has been made. Install the new drier with the arrow on the drier in the direction of the refrigerant flow. • When brazing, protect the drier by using a wet cloth to prevent the drier from overheating. Do not allow the drier to exceed 250°F (121°C).

1) Remove the front panel, then move the power switch to the "OFF" position.

2) Move the control switch to the "DRAIN" position.

3) Move the power switch to the "ON" position.

4) Allow the water to drain from the evaporator.

5) Move the power switch to the "OFF" position, then unplug the unit from the electrical outlet.

6) Remove the top and side panels.

7) Recover the refrigerant and store it in an approved container.

8) Remove the strap connecting the spout to the chute assembly, then remove the spout.

9) Disconnect the water hoses.

10) Remove the extruding head seal bolts. Using the cutter, lift out the auger assembly.

11) Remove the insulation and the expansion valve bulb on the suction line.

12) Disconnect the inlet and outlet tubing.

13) Remove the socket head cap screws and split lock washers securing the evaporator to the lower housing.

14) Lift off the evaporator.

15) Inspect the mechanical seal and O-ring prior to installing the new evaporator. The mechanical seal consists of two parts. One moves along with the auger, and the other is fixed on the lower housing. If the contact surfaces of these two parts are worn, cracked, or scratched, the mechanical seal may cause water leaks and should be replaced. Instructions for removing the mechanical seal and lower housing are located later in this procedure.

16) Make sure the lower mechanical seal is in place, then place the evaporator in position. Secure the evaporator to the lower housing using the socket head cap screws and split lock washers.

17) Remove the drier, then place the new drier in position.

18) Braze all fittings while purging with nitrogen gas flowing at a pressure of 3 to 4 PSIG.

19) Use an electronic leak detector or soap bubbles to check for leaks. Add a trace of refrigerant to the system (if using an electronic leak detector), and then raise the pressure using nitrogen gas (140 PSIG). Do Not use R-404A as a mixture with pressurized air for leak testing.

20) Evacuate the system, and charge it with refrigerant. See the rating label inside the icemaker for the required refrigerant charge. Hoshizaki recommends only virgin refrigerant or reclaimed refrigerant which meets ARI Standard 700 (latest edition) be used.

21) Replace the removed parts in the reverse order of which they were removed.

22) Replace the top and side panels in their correct positions.

23) Move the control switch to the "ICE" position.

24) Plug the unit into the electrical outlet, then move the power switch to the "ON" position to start the automatic icemaking process.

25) Replace the front panel in its correct position.

6. Removal and Replacement of Mechanical Seal and Lower Housing

6a. Mechanical Seal

1) Remove the front panel, then move the power switch to the "OFF" position.

2) Move the control switch to the "DRAIN" position.

3) Move the power switch to the "ON" position.

4) Allow the water to drain from the evaporator.

5) Move the power switch to the "OFF" position, then unplug the unit from the electrical outlet.

6) Remove the top and side panels.

7) Remove the strap connecting the spout to the chute assembly, then remove the spout.

8) Remove the extruding head seal bolts. Using the cutter, lift out the auger assembly.

9) The mechanical seal consists of two parts. One moves along with the auger, and the other is fixed on the lower housing. If the contact surfaces of these two parts are worn, cracked, or scratched, the mechanical seal may cause water leaks and should be replaced.

10) Remove the socket head cap screws and split lock washers securing the evaporator to the lower housing.

11) Raise the evaporator up to access the lower housing.

12) Remove the O-ring and mechanical seal from the housing. If only replacing the mechanical seal, proceed to step 15. ***NOTICE!*** **To help prevent water leaks, be careful not to damage the surfaces of the O-ring or mechanical seal.**

6b. Lower Housing

13) Remove the hex bolts w/washers securing the lower housing to the gear motor and remove the lower housing from the gear motor. If inspection of the upper bearing inside the extruding head (see "V.B.1. Upper Bearing Wear Check") indicates that it is out of tolerance, replace both it and the bearing inside the lower housing.
Note: Replacing the bearing requires a bearing press adaptor. If one is not available, replace the whole extruding head and lower housing.

14) Mount the lower housing on the gear motor.

15) Install the O-ring and lower part of the mechanical seal on the lower housing.

16) Make sure the lower mechanical seal is in place, then place the evaporator in position. Secure the evaporator to the lower housing using the socket head cap screws and split lock washers.

17) Install the auger assembly with the upper part of the mechanical seal attached.

18) Replace the removed parts in the reverse order of which they were removed.

19) Replace the top and side panels in their correct positions.

20) Move the control switch to the "ICE" position.

21) Plug the unit into the electrical outlet, then move the power switch to the "ON" position to start the automatic icemaking process.

22) Replace the front panel in its correct position.

7. Removal and Replacement of Gear Motor

1) Remove the front panel, then move the power switch to the "OFF" position.

2) Move the control switch to the "DRAIN" position.

3) Move the power switch to the "ON" position.

4) Allow the water to drain from the evaporator.

5) Move the power switch to the "OFF" position, then unplug the unit from the electrical outlet.

6) Remove the top and side panels.

7) Remove the strap connecting the spout to the chute assembly, then remove the spout.

8) Remove the hex head bolts and washers securing the lower housing to the gear motor. Lift the evaporator up slightly.

9) Remove the socket head cap screws with split lock washers securing the gear motor.

10) Disconnect the gear motor wiring, then remove the gear motor.

11) Remove the gear motor bracket and spline coupling from the old gear motor and place on the new gear motor.

12) Install the new gear motor and reconnect the electrical wires.

13) Replace the removed parts in the reverse order of which they were removed.

14) Replace the top and side panels in their correct positions.

15) Move the control switch to the "ICE" position.

16) Plug the unit into the electrical outlet, then move the power switch to the "ON" position to start the automatic icemaking process.

17) Replace the front panel in its correct position.

VI. Maintenance

This icemaker must be maintained in accordance with the instruction manual and labels provided with the icemaker. Consult with your local Hoshizaki Certified Service Representative about maintenance service.

⚠ WARNING

- Only qualified service technicians should service this icemaker.
- **CHOKING HAZARD:** Ensure all components, fasteners, and thumbscrews are securely in place after any cleaning or maintenance is done to the unit. Make sure that none have fallen into the dispenser unit/storage bin.

A. Cleaning and Sanitizing Instructions

Hoshizaki recommends cleaning and sanitizing this unit at least twice a year. More frequent cleaning and sanitizing, however, may be required in some existing water conditions.

⚠ WARNING

- To prevent injury to individuals and damage to the icemaker, do not use ammonia type cleaners.
- Carefully follow any instructions provided with the bottles of cleaning and sanitizing solution.
- Always wear liquid-proof gloves and goggles to prevent the cleaning and sanitizing solutions from coming into contact with skin or eyes.
- After cleaning and sanitizing, do not use ice made from the cleaning and sanitizing solutions. Be careful not to leave any solution on the parts or in the dispenser unit/storage bin.

1. Cleaning Solution

IMPORTANT

For safety and maximum effectiveness, use the solution immediately after dilution.

Dilute 9.6 fl. oz. (0.29 l) of Hoshizaki "Scale Away" with 1.6 gal. (6.0 l) of warm water.

2. Cleaning Procedure

1) Remove the front panel, then move the power switch to the "OFF" position. Move the control switch to the "DRAIN" position, then move the power switch back to the "ON" position. Replace the front panel in its correct position.
2) Close the water supply line shut-off valve.
3) Allow the water system to drain for 5 minutes.
4) Remove the front panel. Move the power switch to the "OFF" position, then unplug the unit from the electrical outlet. Remove the top panel.
5) Remove all of the ice from the dispenser unit/storage bin.
6) Remove the strap connecting the spout to the chute assembly, then remove the spout. See Fig. 15.

7) Pour the cleaning solution over the extruding head until the evaporator assembly and the reservoir are full and the solution starts to overflow into the drain pan.
   Note: If there is excess scale on the extruding head, fill the evaporator assembly and reservoir as described above, then use a clamp on the reservoir hose between the reservoir and evaporator assembly to block flow. Pour additional cleaning solution over the extruding head until the evaporator assembly is completely full.

8) Replace the spout and strap in their correct positions.

9) Allow the icemaker to sit for about 10 minutes before operation. If you placed a clamp on the reservoir hose in step 7, remove it before operation.

10) In bad or severe water conditions, clean the float switch assembly as described below. Otherwise, continue to step 11.
    a. Remove the float switch assembly from the reservoir cover.
    b. Wipe down the float switch assembly with the cleaning solution.
    c. Rinse the float switch assembly thoroughly with clean water.
    d. Replace the float switch assembly in its correct position.

11) Wipe down the infrared sensor lens, (located on the bottom of the icemaker) with the cleaning solution. Next, rinse the cleaning solution off of the infrared sensor lens with a clean, damp cloth.

12) Replace the top panel in its correct position. Move the control switch to the "ICE" position, then plug the unit back in. Move the power switch to the "ON" position, then replace the front panel in its correct position. Make ice using the solution until the icemaker stops making ice.

13) Remove the front panel, then move the power switch to the "OFF" position. Move the control switch to the "DRAIN" position, then move the power switch back to the "ON" position. Replace the front panel in its correct position.

14) Allow the water system to drain for 5 minutes.

15) Remove the front panel. Move the control switch to the "ICE" position, then replace the front panel in its correct position.

16) Open the water supply line shut-off valve to supply water to the reservoir.

17) After the gear motor starts, remove the front panel. Move the power switch to the "OFF" position. Move the control switch to the "DRAIN" position, then move the power switch back to the "ON" position. Replace the front panel in its correct position.

18) Allow the water system to drain for 5 minutes.
    Note: If you do not sanitize the unit, go to step 14 in "III.A.5. Sanitizing Procedure - Final."

19) Remove the front panel. Move the power switch to the "OFF" position, then unplug the unit from the electrical outlet. Close the water supply line shut-off valve.

3. Sanitizing Solution

IMPORTANT
For safety and maximum effectiveness, use the solution immediately after dilution.

Dilute 2.5 fl. oz. (74 ml or 5 tbs) of a 5.25% sodium hypochlorite solution (chlorine bleach) with 5 gal. (19 l) of warm water.

4. Sanitizing Procedure - Initial

1) Make sure the power switch is in the "OFF" position, the unit is unplugged from the electrical outlet, and the water supply line shut-off valve is closed. Remove the panels.
2) Remove the strap connecting the spout to the chute assembly, then remove the spout. Remove the rubber O-ring and nylon O-ring at the top of the cylinder and also remove the packing and drip guide between the spout and chute.
3) Pour the sanitizing solution over the extruding head until the evaporator assembly and the reservoir are full and the solution starts to overflow into the drain pan.
4) Remove the proximity switch from the chute assembly, then remove the chute assembly from the icemaker.
5) Remove the packing at the bottom of the ice chute. Remove the 3 ties and the chute insulation.
6) Remove the 2 baffles.
7) Remove the plate and the packing from the top of the ice chute, then remove the backup bin control assembly by sliding it slightly towards the chute opening and lifting it off.
8) Disassemble the backup bin control assembly by removing the 2 snap pins, shaft, and actuator.

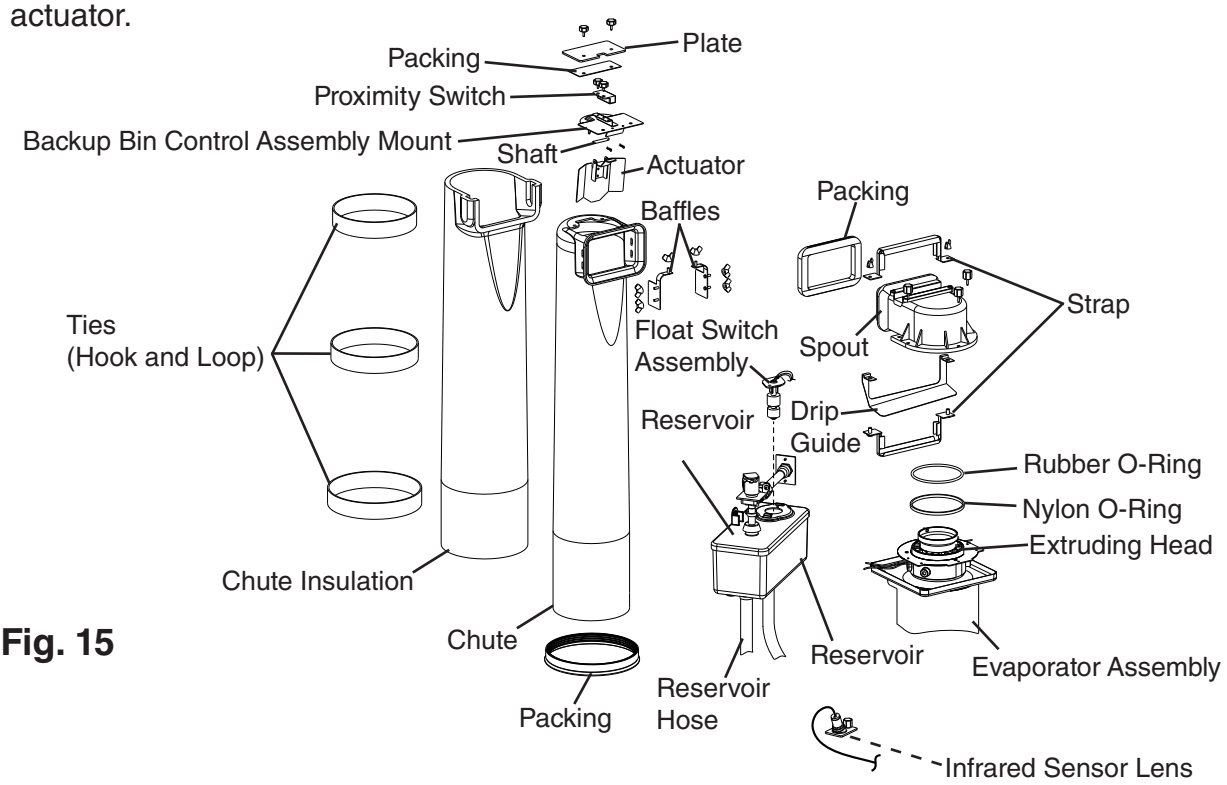


Fig. 15

9) Soak the spout, O-ring, packings, drip guide, chute, baffles, plate, and backup bin control assembly in the sanitizing solution for 10 minutes then wipe them down.

10) Rinse the parts thoroughly with clean water.

NOTICE
If the solution is left on these parts, they will rust.

11) Replace all parts in their correct positions.

IMPORTANT
When installing the baffles, make sure that the bent surface (the one without the studs) faces the actuator so that the bent surface can guide the ice to the center of the actuator.

12) Replace all panels except the front panel in their correct positions. Move the control switch to the "ICE" position, then plug the unit back in. Move the power switch to the "ON" position, then replace the front panel in its correct position. Make ice using the solution until the icemaker stops making ice.

13) Remove the front panel, then move the power switch to the "OFF" position. Move the control switch to the "DRAIN" position, then move the power switch back to the "ON" position. Replace the front panel in its correct position.

14) Allow the water system to drain for 5 minutes.

15) Remove the front panel. Move the power switch to the "OFF" position, then unplug the unit from the electrical outlet.

5. Sanitizing Procedure - Final

1) Mix a new batch of the sanitizing solution.

2) Make sure the power switch is in the "OFF" position, the unit is unplugged from the electrical outlet, and the water supply line shut-off valve is closed. Remove the top panel.

3) Remove the strap connecting the spout to the chute assembly, then remove the spout.

4) Pour the sanitizing solution over the extruding head until the evaporator assembly and the reservoir are full and the solution starts to overflow into the drain pan.

5) Replace the spout and strap in their correct positions.

6) Allow the icemaker to sit for about 10 minutes before operation.

7) Replace the top panel in its correct position. Move the control switch to the "ICE" position, then plug the unit back in. Move the power switch to the "ON" position, then replace the front panel in its correct position. Make ice using the solution until the icemaker stops making ice.

8) Remove the front panel, then move the power switch to the "OFF" position. Move the control switch to the "DRAIN" position, then move the power switch back to the "ON" position. Replace the front panel in its correct position.

9) Allow the water system to drain for 5 minutes.

10) Remove the front panel. Move the control switch to the "ICE" position, then replace the front panel in its correct position.

11) Open the water supply line shut-off valve to supply water to the reservoir.

12) After the gear motor starts, remove the front panel. Move the power switch to the "OFF" position. Move the control switch to the "DRAIN" position, then move the power switch back to the "ON" position. Replace the front panel in its correct position.

13) Allow the water system to drain for 5 minutes.

14) Remove the front panel. Move the control switch to the "ICE" position, then replace the front panel in its correct position.

15) Allow the icemaker to run for about 30 minutes, then remove the front panel. Move the power switch to the "OFF" position, then unplug the unit from the electrical outlet.

16) Pour warm water into the dispenser unit/storage bin and melt any remaining ice. Clean the dispenser unit/storage bin liner using a neutral cleaner. Rinse thoroughly after cleaning.

17) Plug the unit back in. Make sure the control switch is in the "ICE" position, then move the power switch to the "ON" position to start the automatic icemaking process.

B. Maintenance

The maintenance schedule below is a guideline. More frequent maintenance may be required depending on water quality, the icemaker's environment, and local sanitation regulations.

⚠ WARNING

- Only qualified service technicians should service this icemaker.
- Move the power switch to the "OFF" position and unplug the unit from the electrical outlet before servicing.

Maintenance Schedule		
Frequency	**Area**	**Task**
Monthly	External Water Filters	Check for proper pressure and change if necessary.
	Icemaker and Dispenser Unit/ Storage Bin Exterior	Wipe down with clean, soft cloth. Use a damp cloth containing a neutral cleaner to wipe off oil or dirt build up. Clean any chlorine staining (rust colored spots) using a non-abrasive cleaner like Zud or Bon Ami.
	Infrared Sensor Lens; Underside of Icemaker and Top Kits; Bin Door and Snout (if applicable)	Wipe down with clean cloth and warm water.
Every 6 Months	Icemaker and Dispenser Unit/ Storage Bin	Clean and sanitize per the cleaning and sanitizing instructions provided in this manual.
	Evaporator Condensate Drain Pan and Gear Motor Drain Pan	Wipe down with clean cloth and warm water. Slowly pour one cup of sanitizing solution (prepare as outlined in the sanitizing instructions in this manual) into the evaporator condensate drain pan. Be careful not to overflow the pan. This solution will flow down to the gear motor drain pan and out the drain line to sanitize these areas. Repeat with a cup of clean water to rinse.
	Icemaker and Dispenser Unit/ Storage Bin Drains	Check to make sure they are clear.
Yearly	Inlet Water Valve and Drain Valve	Close the water supply line shut-off valve and drain the water system. Clean the inlet water valve screen and clean and inspect the drain valve.
	Water Hoses	Inspect the water hoses and clean/replace if necessary.
	Condenser	Inspect. Clean if necessary by using a brush or vacuum cleaner.
	Icemaker	Inspect for oil spots, loose components, fasteners, and wires.
	Upper Bearing (extruding head)	Check for wear using .02" round stock or pin gauge. Replace both upper bearing and lower bearing if wear exceeds factory recommendations. See the Service Manual for details.
After 3 Years, then Yearly	Upper Bearing (extruding head); Lower Bearing and O-Ring (lower housing); Mechanical Seal; Evaporator Cylinder; Auger	Inspect. Replace both upper bearing and lower bearing if wear exceeds factory recommendations. Replace the mechanical seal if the seal's contact surfaces are worn, cracked, or scratched.

C. Preparing the Icemaker for Periods of Non-Use

NOTICE
When storing the icemaker for an extended time or in sub-freezing temperatures, follow the instructions below to prevent damage.

When the icemaker is not used for two or three days under normal conditions, it is sufficient to only move the power switch to the "OFF" position. When storing the icemaker for extended time or in sub-freezing temperatures, follow the instructions below.

1. Remove the water from the icemaker water supply line:

1) Remove the front panel.
2) Move the power switch to the "OFF" position.
3) Close the icemaker water supply line shut-off valve, then open the icemaker water supply line drain valve.
4) Allow the line to drain by gravity.
5) Attach a compressed air or carbon dioxide supply to the icemaker water supply line drain valve.
6) Move the control switch to the "ICE" position, then move the power switch to the "ON" position.
7) Blow the icemaker water line out using the compressed air or carbon dioxide supply.
8) Close the icemaker water supply line drain valve.

2. Drain the evaporator:

1) Move the power switch to the "OFF" position. Move the control switch to the "DRAIN" position, then move the power switch back to the "ON" position. Replace the front panel in its correct position.
2) Allow the water system to drain for 5 minutes.
3) Remove the front panel, then move the power switch to the "OFF" position.
4) Remove the evaporator drain line hose from the evaporator and attach a compressed air or carbon dioxide supply to the hose.
5) Move the power switch to the "ON" position. Blow out the evaporator drain line using the compressed air or carbon dioxide supply until water stops coming out.
6) Move the power switch to the "OFF" position, then reconnect the evaporator drain line hose.
7) Move the control switch to the "ICE" position. Replace the front panel in its correct position, then unplug the unit from the electrical outlet.
8) Remove all ice from the dispenser unit/storage bin. Clean the dispenser unit/storage bin liner using a neutral cleaner. Rinse thoroughly after cleaning.

3. Turn off the power supply to the remote condensing unit:

1) Turn off the power supply to the remote condensing unit.

2) When restarting, follow the instructions in the instruction manual. The remote condensing unit should have power for a minimum of 4 hours prior to startup to prevent compressor damage.

VII. Disposal

This unit contains refrigerant and must be disposed of in accordance with applicable national, state, and local codes and regulations. Refrigerant must be recovered by properly certified service personnel.